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Honeywell

SERIES 16 FIELD EXPANSION AND REFERENCE MANUAL

42401241-100

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This section outlines the configuration rules for the H316.

3.1 BASIC H316 SYSTEMS

The basic H316 computer contains a mainframe logic drawer (including 4K of memory), power supply and control panel, which is supplied in either a table top version or mounted in a standard 19 inch rack.

3.1.1 Mainframe Drawer

Figure 3-1 indicates the basic mainframe drawer which is divided into four sections designated A1, A2, A3 and A4.

A1 contains the central processor, basic 4K of memory and space for eight 1 x 3 option blocks.

A2 is the control panel for communication with the central processor.

A3 contains the power supply.

A4 is the front sub-panel containing the fan assembly.

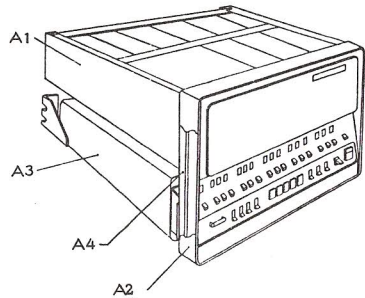


Figure 3-1 Mainframe Drawer

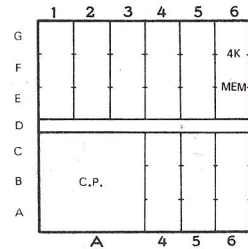


Figure 3-2 Mainframe Logic Drawer

3.1.2 Mainframe Logic Drawer

Figure 3-2 shows the mainframe logic drawer coding, the position of the central processor and the 4K memory module (viewed from the pac side). These two units may not be moved to any other position within the drawer other than indicated.

3.1.3 Option Drawer

The option logic drawer can either be a rack or table mounted assembly. Up to two option drawers can be fitted into a 316 system. Figure 3-3 shows an option drawer including the blank control panel and power supply. Each option drawer can contain two adjacent 6 x 3 microblocks or up to twelve 1 x 3 microblocks.

3.1.4 Option Logic Drawer Coding

Figure 3-4 shows the option logic drawer coding. The first option drawer is coded B1 and the second C1.

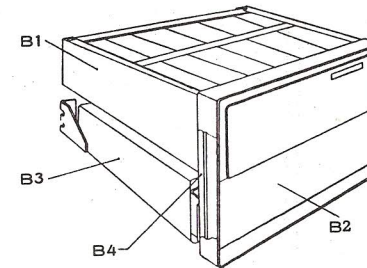


Figure 3-3 H316 Option Drawer

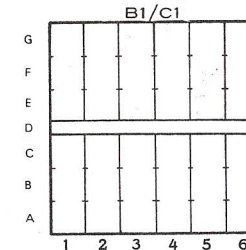


Figure 3-4 Option Logic Drawer Coding (Pac Side)

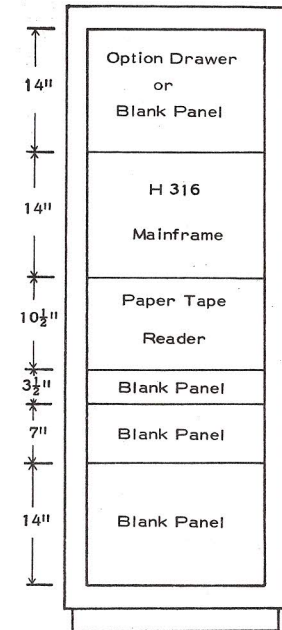


Figure 3-5 Typical Single Rack Configuration

3.1.5 Microblock and Pin Identification

Microblock and pin identification for an option drawer is as shown in Figure 3-6.

3.1.6 Option Placement within a 72 inch Cabinet

Figure 3-5 shows the mandatory placement of the H316 mainframe and optimum placement of an option drawer and the Paper Tape Reader.

Figure 3-7 shows the typical placement of options in a two rack configuration. If a paper tape punch is rack mounted it should not be mounted directly above the disc unit or the mainframe drawer. This is to avoid chad or paper dust interfering with the operation of the control panel switches or blocking the disc filter.

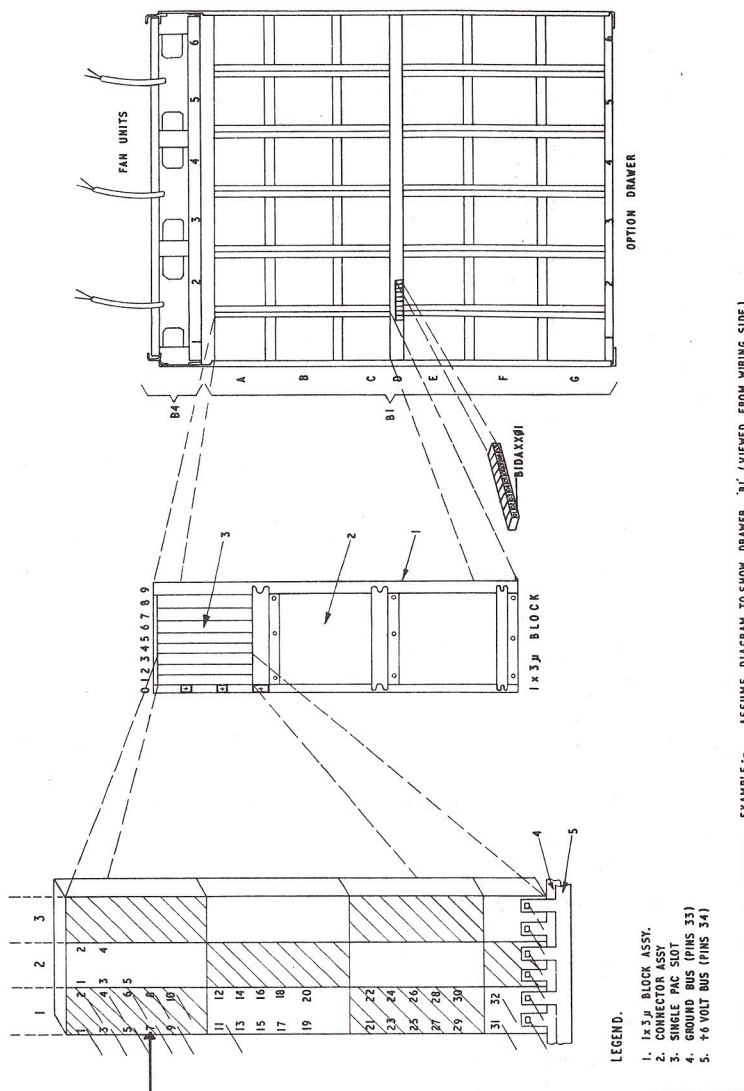


Figure 3-6 Microblock and Pin Identification

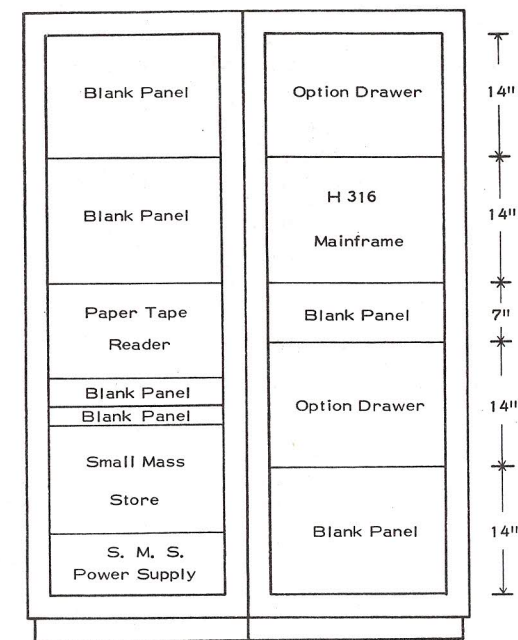


Figure 3-7 Typical Double Rack Configuration

3.2 MEMORY AND OPTION EMPLACEMENT

This section indicates the mandatory positions for the memory, memory expansion, memory parity, memory lockout and DMC options.

Any option occupying the position required by one of these options, for an expansion, must be relocated. This may require an additional drawer or cables, etc.

3.2.1 Memory Location for up to 16K of Memory

Table 3-1 below shows the memory placement for up to 16K of memory. Only 4K memory modules are available on the H316 and each occupies a standard 1 x 3 location.

Table 3-1 Memory Placement up to 16K

Memory Size	Placement
First 4096 Words (standard)	A1E6, A1F6, A1G6
Second 4096 Words	A1E5, A1F5, A1G5
Third 4096 Words	A1E4, A1F4, A1G4
Fourth 4096 Words	A1E3, A1F3, A1G3

3.2.2 Memory Expansion above 16K

If the memory to be expanded is above 16K, the extended addressing option is required as a prerequisite. When installing memory expansion, it must be placed in drawer B1 adjacent to drawer A1.

Table 3-2 shows the placement of the memories and the option 1 x 3.

Table 3-2 Memory Placement above 16K

Memory Size	Memory Placement	1 x 3 Placement
Fifth 4096 Words	B1E6, B1F6, B1G6	B1E5, B1F5, B1G5
Sixth 4096 Words	B1E5, B1F5, B1G5	B1E4, B1F4, B1G4
Seventh 4096 Words	B1E4, B1F4, B1G4	B1E3, B1F3, B1G3
Eighth 4095 Words	B1E3, B1F3, B1G3	B1E2, B1F2, B1G2

3.2.3 Memory Parity Location

The location of the memory parity 1 x 3 (ICM-160) will depend upon the amount of memory in the system. Table 3-3 below shows the placement of the parity 1 x 3 for different memory configurations.

If memory parity and no memory lockout is ordered the CC-621 pac is used in the CP.

If memory parity and memory lockout are ordered the CC-558 pac is used in place of the CC-621 pac in the CP.

Table 3-3 Memory Parity Placement

Memory Size	Parity 1 x 3 Placement
4K	A1E5, A1F5, A1G5
8K	A1E4, A1F4, A1G4
12K	A1E3, A1F3, A1G3
16K	A1E2, A1F2, A1G2
20K	B1E4, B1F4, B1G4
24K	B1E3, B1F3, B1G3
28K	B1E2, B1F2, B1G2
32K	B1E1, B1F1, B1G1

3.2.4 Memory Lockout (MLO) Location

If no more than 16K MLO (one 1 x 3) is ordered, it must be located in the E, F, G portion of Row 1 in drawer A1. If more than 16K MLO (one 2 x 3) is ordered, it must be located in the E, F, G portion of Row 1, 2 in drawer A1. The amount of Memory Lockout in a system must always equal or exceed the total memory in the system.

3.2.5 DMC Location

If an HSDMC (316-21) is ordered, it must be located in the A, B, C portion of Row 4, 5, 6 in drawer A1. If an SDMC (316-20) is ordered, it must be located in the A, B, C portion of Row 4, 5 in drawer A1. If no DMC option is ordered, this portion of the drawer may be occupied by any option 3 x 3 or smaller. The configurator will determine the number of DMC channels required and will ensure that unused channels are inhibited.

3.2.6 Total Number of Option 1 x 3's

Mainframe capacity: Eight 1 x 3 option blocks.

Option drawer capacity: Twelve 1 x 3 option blocks.

The number of 1 x 3's is determined by selecting the options called for and accumulating the total. If these options, including memory, add up to more than nine 1 x 3's, an option drawer will be required. This may also be true for some systems containing less than nine option 1 x 3's. For instance, if an 8K memory size (two 1 x 3's) and an MTCU (one 5 x 3) are in the system (seven 1 x 3's total), it cannot be contained within the CP logic drawer. In any system, memory 1 x 3's, DMC, MLO and Memory Parity, must be allocated first.

3.2.7 Option Location within the Drawer

When allocating option 1 x 3's within the CP logic drawer, it is best to start the first option in location A1A4 and work out to A1A6. Then go from A1A6 to the first usable location adjacent to memory. This should be done in order to keep the I/O bus as short as possible.

When placing options in an option drawer, start the first non-memory option in B1A1 and work toward B1A6. From B1A6, go to B1E6 or the first usable space next to memory. From there, work toward B1E1. The same is true for option C1 except that this drawer cannot contain memories.

3.2.8 Filler Plates

After all the options have been located, all empty 1 x 3 locations must be filled with the filler plates which were removed prior to installation/expansion of options.

3.3 CABLES AND JUMPERS

This section covers the I/O bus and jumper cables required for a system.

3.3.1 Input/Output Bus

Communications between peripheral devices and the CP is accomplished by using an input/output bus consisting of input and output data lines, address lines, and control lines, consisting of two 34-way standard upac cables.

The I/O bus has sufficient capacity to serve 20 options filling a three drawer system.

The total cable length must not exceed 25 feet (in addition to the standard intradrawer cabling) when correctly terminated.

All options on the H316 system must be connected to the I/O bus by either flex or upac to upac cables.

Figure 3-8 shows a typical H316 system. Shown are the I/O bus cables for units A1 and B1. If the system contains a second option drawer it will be cabled in the same manner as B1.

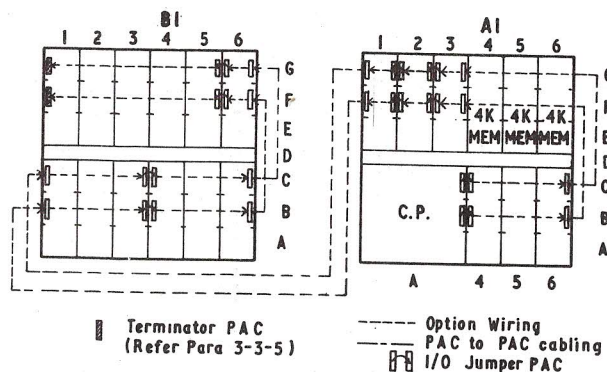


Figure 3-8 Typical H316 Cabling System

3.3.2 I/O Bus Cable Priority

The I/O Bus begins at A1RA20 and A1CA20 of the CP and connects to the first option adjacent to it. It then proceeds towards areas B6, C6. From there it is taken by way of two upac cables to the first option adjacent to the memory and then works its way to areas F1, G1.

3.3.3 I/O Bus in First Option Drawer (B1)

Two upac cables leave drawer A1 from the last option (nearest to area F1, G1) and terminate in drawer B1 in the area of B1, C1. From there, jumper pacs carry the bus towards B6, C6. Two upac cables then take the I/O bus to area F6, G6 and jumper pacs continue the bus to area F1, G1.

3.3.4 I/O Bus in Second Option Drawer (C1)

When a second option drawer is installed, two upac cables leave drawer B1 in the area of F1, G1 and terminate in drawer C1 in the area of B1, C1. The I/O bus cabling within drawer C1 is then identical to that of drawer B1.

3.3.5 I/O Bus Termination

Two termination upacs must be added to the end of the I/O bus when drawer B1 of B1 and C1 are used. Reference to Table 3-4 below will indicate which termination pacs are required.

Table 3-4 Termination Pac Chart

Drawer Fitted	Less than 7 Options	7 or More Options
A1	None	None
A1 + B1	CC-690A	CC-690A
A1 + B1 + C1	CC-691A	CC-690A

Termination pac CC-690A Part Number 70029321-704

Termination pac CC-691A Part Number 70029321-705

3.3.6 Cable Lengths

DMC and I/O bus cable lengths required for the inter-connection of options within a system can be obtained from Table 3-5 below.

Table 3-5 Cable Lengths

Location	Cable Type	Part Number	Length
I/O Bus between adjacent options	Jumper pac	70014998-702	7 inches
I/O Bus within the same drawer	upac to upac	70013826-xxx	2 feet
DMC cable between adjacent drawers	upac to upac	70013826-xxx	8 feet
I/O bus between adjacent drawers	upac to upac	70013826-xxx	11 feet
Between drawers, separated by drawer	upac to upac	70013826-xxx	12.5 feet

NOTE

Only one DMC cable is run to an option drawer. Additional options within the drawer requiring DMC signals are linked across by short jumper wires.

3.3.7 Jumper Wires

After the system has been configured, add ground and voltage bus jumpers to the following points where applicable.

Mainframe Ground Jumpers (Drawer A1)

From	To	From	To
A48-33	A51-33	F18-33	F21-33
A58-33	A61-33	F28-33	F31-33
B48-33	B51-33	F38-33	F41-33
B58-33	B61-33	F48-33	F51-33
C48-33	C51-33	F58-33	F61-33
C58-33	C61-33	G18-33	G21-33
E18-33	E21-33	G28-33	G31-33
E28-33	E31-33	G38-33	G41-33
E38-33	E41-33	G48-33	G51-33
E48-33	E51-33	G58-33	G61-33
E58-33	E61-33		

Mainframe voltage jumpers, as above except pin 34 is used in all cases.

Option Drawer Ground Jumpers (Drawer B1 or C1)

From	To	From	To
A18-33	A21-33	E18-33	E21-33
A28-33	A31-33	E28-33	E31-33
A38-33	A41-33	E38-33	E41-33
A48-33	A51-33	E48-33	E51-33
A58-33	A61-33	E58-33	E61-33
B18-33	B21-33	F18-33	F21-33

Option Drawer Ground Jumpers (Drawer B1 or C1) (Continued)

<u>From</u>	<u>To</u>	<u>From</u>	<u>To</u>
B28-33	B31-33	F28-33	F31-33
B38-33	B41-33	F38-33	F41-33
B48-33	B51-33	F48-33	F51-33
B58-33	B61-33	F58-33	F61-33
C18-33	C21-33	G18-33	G21-33
C28-33	C31-33	G28-33	G31-33
C38-33	C41-33	G38-33	G41-33
C48-33	C51-33	G48-33	G51-33
C58-33	C61-33	G58-33	G61-33

Option drawer voltage jumpers, as above, except pin 34 is used in all cases.

NOTE

If in any of the runs Pin 33 or Pin 34 has a wire on it in the specified slot, choose a higher or lower number "slot" in the same row.

SECTION 4

DDP 416/516 CONFIGURATION RULES

- 4.1 GEOGRAPHY
- 4.2 CONFIGURATION
- 4.3 MEMORY AND OPTION EMPLACEMENT
 - 4.3.1 Memory Location
 - 4.3.2 Memory Expansion Option
 - 4.3.3 Memory Parity Option
 - 4.3.4 Memory Lockout Option
 - 4.3.5 DMC Option
 - 4.3.6 DMA Option
 - 4.3.7 Option Location within a Drawer
 - 4.3.8 Filter Plates
- 4.4 CABLES AND JUMPERS
 - 4.4.1 Input/Output Bus
 - 4.4.2 I/O Bus Cable Routing
 - 4.4.3 I/O Bus in an Option Drawer
 - 4.4.4 I/O Bus Termination
 - 4.4.5 DMC Cables
 - 4.4.6 DMA Bus
 - 4.4.7 Cable Lengths
 - 4.4.8 Jumper Wires

This section outlines the configuration rules for the DDP-416 and DDP-516.

4.1 GEOGRAPHY

The method of identifying cabinets, drawers, microblocks, etc., is outlined below. In some instances tall-boy cabinets are used. Reference should be made to the DDP-516 Instruction Manual Volume 3 for the geography of tall boys.

The basic cabinet is designated as Unit A, the second cabinet as Unit B and the third as Unit C. The power supplies and drawers within the cabinets are allocated the numbers shown in Figure 4-1. For example, the Central Processor Unit is identified as A1.

The CPU, A1, is referenced as a 6 x 6 microblock as shown in Figure 4-2. Each tilt-out drawer can contain two adjacent 6 x 3 microblocks. Each 6 x 3 section is referenced as shown in Figure 4-3. The main grid reference locates a connector assembly. Figure 4-4 shows connector assembly B1 highlighted. A connector assembly (1 x 1 microblock) can contain eight micropacs which are numbered 1 to 8 as shown. There are 34 pins to each micropac. Figure 4-4 shows an example of locating a particular pin in a computer system.

4.2 CONFIGURATION

The basic computer is assembled in a single cabinet with the manual controls and indicators situated separately in a console. The cabinet is divided into three sections:-

- The left-hand section (located A3, A2) - this contains an RP-61 power supply and distribution unit.
- The middle section (located A1) - this comprises a tilt-out drawer containing the CPU which is pre-wired for maximum configuration systems.

In addition to the CP, this drawer contains a pre-wired 1 x 3 microblock (located at A1D1, A1E1, A1F1) which is reserved for the mainframe part of the Direct Memory Access Option (DMA). A section (located at A1A1, A1B1, A1C1) is reserved for the 1 x 3 microblock Direct Multiplex Control Option (DMC) if fitted, or an input/output option interface if not (this is always the Teletype interface in a single-bay systems).

- The right-hand section (located A5, A4) - this comprises a tilt-out drawer containing up to 16K of core memory. A 4K or 8K module each require half a tilt-out drawer. Thus, in 4K or 8K systems there is room for up to six relocatable 1 x 3 microblock input/output interface assemblies. In 12K and 16K systems, the whole drawer section is required for memory and memory logic. Memory above 16K goes into B1 and B2 in the second cabinet.

One or two extra cabinets can be fitted to a computer system. A typical three bay configuration is shown in Figure 4-1. Each extra cabinet normally contains one RP-62 power supply situated in the right-hand section and one tilt-out drawer. A second tilt-out drawer can be fitted if required.

The first extra cabinet in standard options can contain up to two additional 8K memory modules to provide 24K or 32K of memory (non-standard options can provide up to 48K), or it can be used for relocatable input/output microblocks.

The second additional cabinet can contain two drawers of relocatable input/output microblocks.

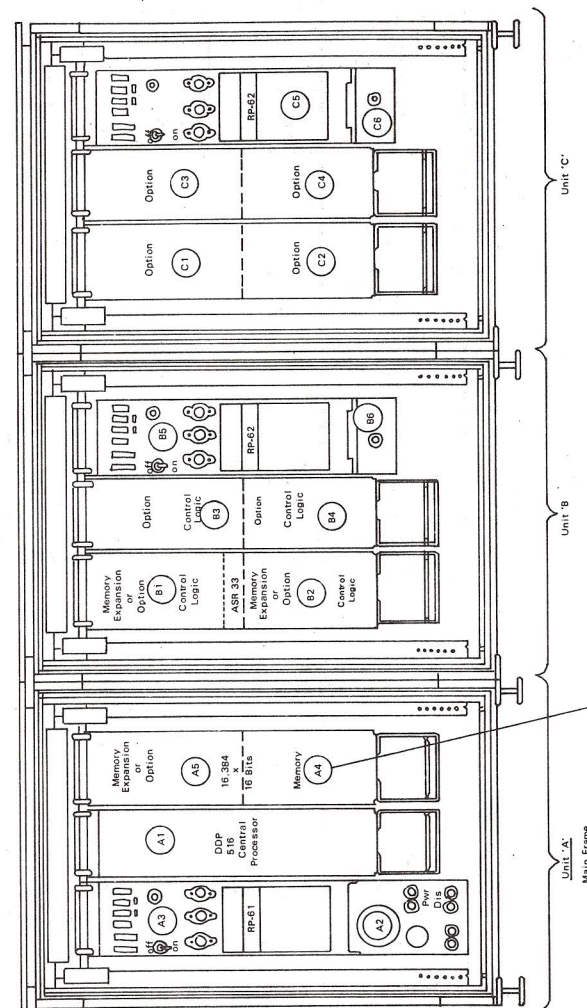


Figure 4-1 Typical Three-Bay System Equipment Configuration

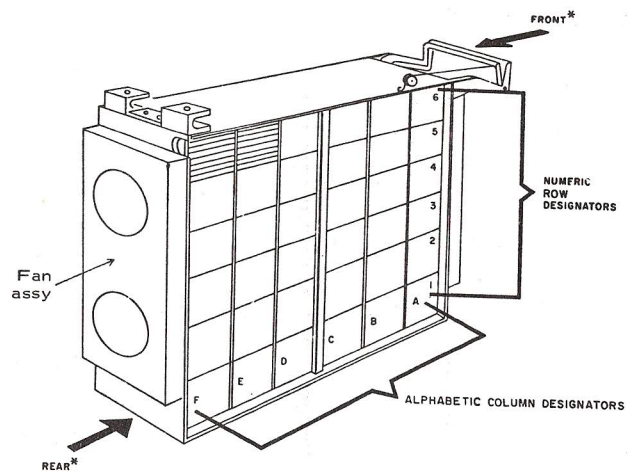


Figure 4-2 Central Processor Unit Tilt-Out Drawer Assembly (Pac Side)

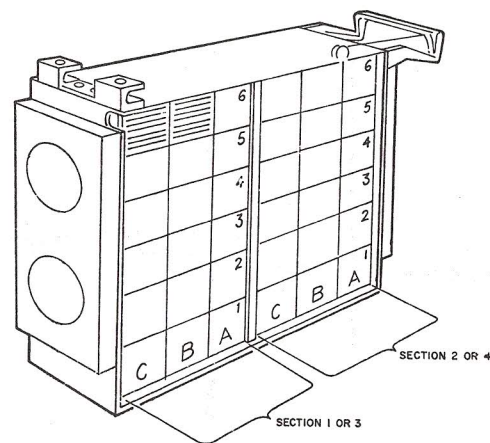


Figure 4-3 Option Logic Tilt-Out Drawer Assembly (Pac Side)

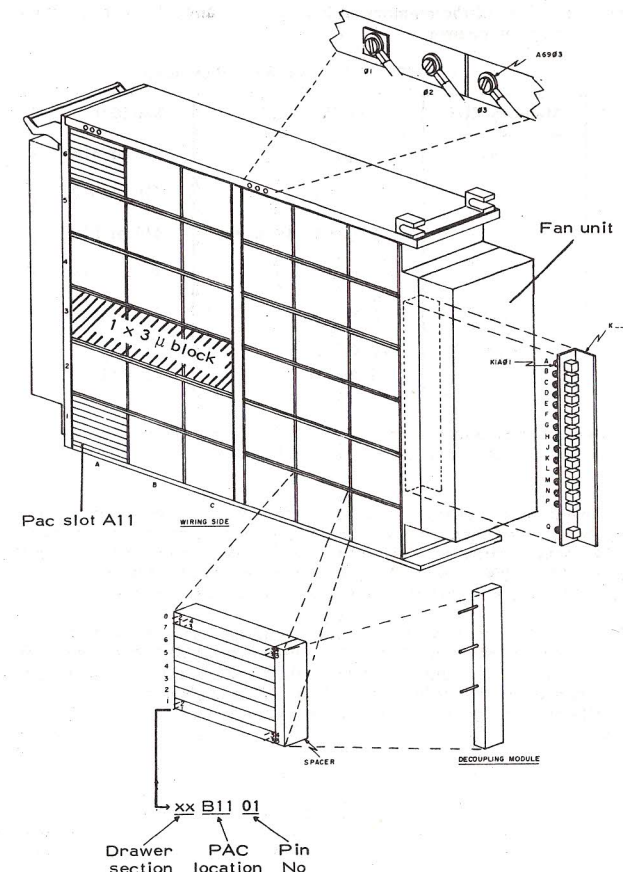


Figure 4-4 Option Drawer Microblock and Pin Identification

4.3 MEMORY AND OPTION EMPLACEMENT

This section indicates the mandatory positions for the memory, memory lockout, DMC and DMA options.

Any option occupying the position required by one of the above options for an expansion must be relocated. This may require an extra drawer, cables, etc.

4.3.1 Memory

The placement of the memory is indicated in Table 4-1 below. Each 4K or 8K memory occupies half of an option drawer.

Table 4-1 Memory Placement

Memory Size	Placement	Machine
4K	4K in A4	416 or 516
8K	8K in A4	416 or 516
12K	8K in A4. 4K in A5	416 or 516
16K	8K in A4 and A5	416 or 516
*24K	8K in A4, A5 and B2	516 only
*32K	8K in A4, A5, B2 and B1	516 only

* Memory expansions to the DDP-516 which take the memory above 16K require the Memory Expansion Option logic in addition to the extra memory.

A Memory Expansion is realised by reclaiming all or part of the existing memory and installing a new expanded memory package. For instance, an expansion from 8K to 16K requires the existing 8K memory drawer to be replaced by a 16K memory drawer. In the case of an expansion from 16K to 32K it is only necessary to specify an extra 16K memory drawer, and the Memory Expansion Option. Complete 16K drawers are not replaced.

The optimum operating voltage of the existing, non-replaceable part of the memory specified on the memory stack itself should be noted on the SEP in the space reserved for notes and remarks. Local Sales Administration should be advised to quote this voltage with the system serial number on the Order Notification. This enables Newhouse to check these values against their file of operating values and system serial numbers and thus supply a compatible memory drawer.

Memory expansions should be specified as follows:-

Table 4-2 Memory Drawer Coding

416/516-YA	4K Memory Drawer Assembly
416/516-YB	8K Memory Drawer Assembly
416/516-YC	12K Memory Drawer Assembly
416/516-YD	16K Memory Drawer Assembly

Reference must be made to section 4.3.3 Memory Parity, if the system to be expanded has the Memory Parity Option fitted.

4.3.2 Memory Expansion Option 516-05/06

The Memory Expansion Option is required for any memory expansion to the DDP-516 above 16K. Reference may be made to the Memory Expansion Option manual.

Before the Memory Expansion Option can be installed it is necessary that the DDP-516 is at Rev. status D. A note to this effect should be made on the SEP.

The Memory Expansion Option logic consists of micropacs located in pre-wired positions within the mainframe drawer A1.

Memory expansions for the DDP-516 above 32K are treated as non-standard options.

4.3.3 Memory Parity Option DDP-416/516-07-1/2

A Memory Parity system consists of one or more special 17 bits per word memory units (4K or 8K) and the micropacs required for memory parity function, all of these extra micropacs are situated in the CPU mainframe which is already pre-wired. No extra option blocks are involved.

If a system is to be expanded to include the Memory Parity Option all the existing core memory drawers must be removed and the special Memory Parity drawers specified on a replacement basis.

There is no separate part number for a parity drawer, this must be specified using the standard memory drawer part number with a note stating that a Parity Drawer is required. The fact that a Parity Drawer is required must be noted in the Notes and Remarks section of the SEP for Local Sales Administration attention.

The memory expansion of an existing Parity system requires only the extra Parity Memory to be specified, expansion of the Memory Parity Option is not necessary. For instance, to expand an 8K Parity system to a 16K Parity system it is only necessary to specify a 16K Parity Memory drawer as replacement and extra cables, extra cabinet, tilt-out drawers, etc., if necessary. The existing 8K drawer is returned, and any option blocks present in this drawer must be relocated.

4.3.4 Memory Lockout Option DDP-416/516-08/08-1

The Memory Lockout Option consists of micropacs situated in pre-wired spaces in the CPU drawer and a relocatable 1 x 3 microblock for coverage up to 24K. For coverage above 24K a 2 x 3 microblock is required. Memory Lockout above 16K is only available for the DDP-516. Refer to the option manual for details.

If a Memory Lockout coverage required is less than the total memory of the system additional pacs shown in Table 4-3 are required and should be specified on the SEP.

Table 4-3 Additional Pacs for M. L. O.

Memory	Memory Lockout	Extra DG-336 Pacs	Pac Location (Mainframe)
16K	8K	2	A62, A63
24K	8K	4	A62, A63, A64, A65
32K	8K	5	A62, A63, A64, A66, A67
24K	16K	2	A64, A65
32K	16K	4	A64, A65, A66, A67
32K	24K	2	A66, A67

4.3.5 Direct Multiplex Control Option DDP-416/516-20

The DMC Option consists of a 1 x 3 microblock which must be situated in the fixed mainframe position, A1A1, A1B1, A1C1, and some additional mainframe micropacs. The micropac complement is dependent on the number of DMC channels required. The minimum number of channels is four and this can be extended in increments of four channels (by adding a CC-044 micropac) to a maximum of 16 channels (four CC-044 micropacs).

If the DMC requires expanding, a note stating that an extra CC-044 micropac is required for the DMC should be entered on the SEP form. If a standard option is to operate in the DMC mode a DMC sub-channel for this option is required.

The following example should clarify the above procedure. It is required to expand a system incorporating a Magnetic Tape Option (DDP-516-4110) at present operating in the Standard I/O Mode to operate in the DMC Mode. The present configuration has DMC with four channels used to capacity.

This expansion requires:-

- A CC-044 micropac to expand the DMC to eight channels.
- A DMC sub-channel, for the Magnetic Tape Option, DDP-516-4106.
- All ancillary equipment.

4.3.6 Direct Memory Access Option DDP-416/516-21

The DMA option consists of a relocatable 2 x 3 option block and micropacs, some of which are located in the pre-wired 1 x 3 microblock in the mainframe positions A1D1, A1E1 and A1F1. The rest of the micropacs are located in the memory expansion area of the mainframe.

The relocatable 2 x 3 option block should be mounted as close to the hinge as possible in the option tilt-out drawer nearest to the mainframe.

The capacity of DMA is expandable from one channel by increments of one channel to a maximum of four.

If a standard option is to operate on DMA, a DMA sub-channel for this option is required.

4.3.7 Option Location within a Drawer

Option drawer capacity equals two 6 x 3 or twelve 1 x 3 option blocks. A drawer with only 4 or 8K of memory will have room for six 1 x 3 option blocks. A drawer with 16K of memory is filled to capacity.

When locating options the memory must be allocated first, starting with A4 then to A5, B2 and B1. DMA, memory lockout and priority interrupts should then be located in the first available space after memory. One option drawer should be completely filled before proceeding to the next, working from left to right. This is to minimise the length and number of cables required.

Locate all DMA options in the same tilt-out drawer if possible.

All DMA options must be contained within two tilt-outs with at least one device connected to the standard I/O bus in each tilt-out. If the DMA options require more than two tilt-outs, the configuration is illegal.

Locate all options connecting to the DMC in the same tilt-out, if possible. All DMC type options must be contained within two tilt-outs otherwise, the configuration is illegal.

4.3.8 Filler Plates

After all the options have been located, all empty 1 x 3 locations must be filled with the filler plates which were removed prior to installation/expansion of options.

4.4 CABLES AND JUMPERS

4.4.1 Input/Output Bus

Communication between peripheral devices and the CP is accomplished by using an input/output bus consisting of input and output data lines, address lines and control lines, consisting of two 34-way standard micropac cables.

The I/O bus has sufficient capacity to drive up to twenty options located within three tilt-out drawers. The total cable length interconnecting the three drawers must not exceed twenty feet (in addition to the standard intra-tilt-out cabling).

4.4.2 I/O Bus Cable Routing

The I/O bus originates from A1B21 and A1C21 of the mainframe drawer and goes to the first I/O option drawer. If a standard I/O option is located in position A1, B1, C1 of the mainframe, two jumper pacs link the I/O bus to the option. The I/O bus then leaves the mainframe drawer (A1) from positions A1B11 and A1C11.

4.4.3 I/O Bus in an Option Drawer

The I/O bus enters an option drawer in positions B68 and C68 (nearest to the hinge) and leaves from positions B68 and C68 farthest from the hinge. Jumper pacs link all the adjacent options together and two short cables link the two halves of the drawer, as shown in Figure 4-5.

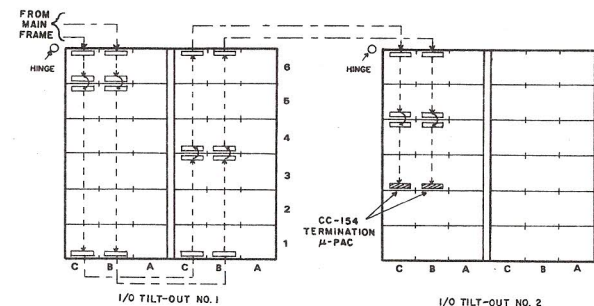


Figure 4-5 Routing of I/O Bus Through Tilt-Out Assemblies (Pac Side)

4.4.4 I/O Bus Termination

Correct termination is accomplished by inserting two CC-154 micropacs in the last option on the I/O bus.

4.4.5 DMC Cables

Options on the DMC use the standard I/O bus for data transfers. An additional cable carrying DIL, DAL signals is run to the DMC option nearest to the hinge in an option drawer. Other options within the drawer requiring the DIL, DAL signals are linked by short jumper wires.

4.4.6 DMA Bus

An option using DMA is connected to the DMA bus instead of the I/O bus. When an option is used on DMA the I/O cables in the option block are replaced by the DMA cables. The DMA bus originates at the mainframe portion of the DMA and consists of input data lines (LIB's), output data lines (LOB's). An additional cable is also run from the DMA external 2 x 3 microblock carrying control signals to the option. Where more than one option is to use DMA an

attempt should be made to obtain an adjacent configuration in the same tilt-out drawer. This minimises the length of the DMA bus and enables the control request lines between the options and the DMA relocatable block to be hard-wired. See Figure 4-6.

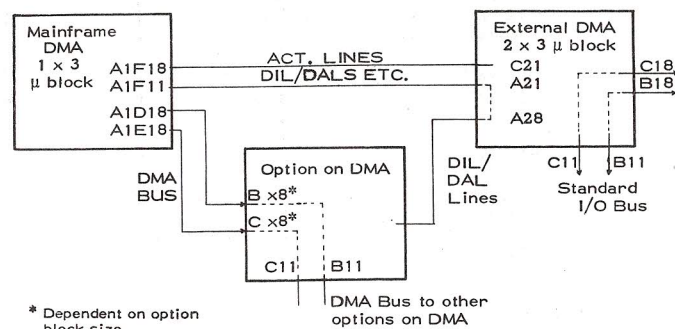


Figure 4-6 DMA Cabling

All cables and termination pacs used with DMA are the same as used with the I/O bus.

4.4.7 Cable Lengths

After a system has been configured, the required cables and their lengths can be calculated from the following tables:-

- Memory Cable List - Table 4-4
- Ancillary (Power) Cable List - Table 4-5
- Micropac Cable List - Table 4-6

Table 4-4 DDP-516 Memory Cable List

Memory	Location	Part Number	Length
Basic Memory Size 0 - 8K	A1F61-A4C67	70014997-703	52 inches
	A1E58-A4C68	70014997-701	56 inches
Extra Cables for 8 - 16K	A1F58-A5C67	70014997-704	46 inches
	A4B68-A5C68	70013826-701	2 feet
Extra Cables for 16 - 24K	A1F51-B2C67	70014997-705	80 inches
	A1E51-B2C68	70014997-702	84 inches
Extra Cables for 24 - 32K	A1F48-B1C67	70014997-706	74 inches
	B2B68-B1C68	70013826-701	2 feet

(A 32K machine contains all eight cables).

DDP-416 Memory Cables are as above but only up to 16K of memory.

Table 4-5 Ancillary (Power) Cable List

Cable	Part Number	Drawer	Length
Fan Cable 115V AC (ELCO to ELCO)	70014551-xxx	B1/B2	90 inches
		B3/B4	90 inches
		C1/C2	112 inches
		C3/C4	112 inches
115V AC Power Supply Cable RP61 to RP62 (Hubble to Hubble)	70015500-xxx	RP62 to Bay 'B'	10 feet
		RP62 to Bay 'C'	12 feet
DC Power Loom RP61 to Memory Drawer (QK DIS to QK DIS)	70014553-702 70014553-703 70014553-704	A4 and A5	42 inches
		B2 only	72 inches
		B1 and B2	72 inches
DC Power Loom RP62 to Option Drawer (QK DIS to QK DIS)	70014556-xxx	B1/B2	38 inches
		B3/B4	30 inches
		C1/C2	38 inches
		C3/C4	30 inches
ASR DC Power Cable (24V) Internal to Bays (QK DIS to QK DIS)	70014552-xxx	B1/B2	8 feet
		B3/B4	8 feet
		C1/C2	12 feet
		C3/C4	12 feet

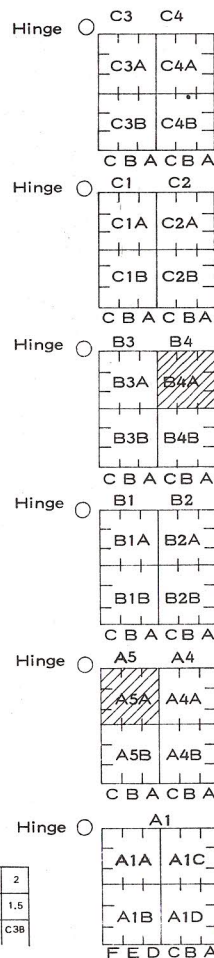
Table 4-6 Cable Lengths (In feet)

CABLE LENGTHS

Cable lengths for standard systems (up to 3-bays) can be calculated from the table. Cable lengths for systems using tall-boys must be measured.

To obtain a cable length between two locations, identify the locations on the left-hand column and bottom row and then cross reference them. The cable length between locations A5A and B4A is shown highlighted.

A4A	5.5	6.5	6	7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
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4.4.8 Jumper Wires

After the system has been configured add the Ground and Voltage bus jumpers to the following points in the mainframe and option drawers:-

Ground Jumpers

<u>From</u>	<u>To</u>	<u>From</u>	<u>To</u>
A18-33	A21-33	D18-33	D21-33
A28-33	A31-33	D28-33	D31-33
A38-33	A41-33	D38-33	D41-33
A48-33	A51-33	D48-33	D51-33
A58-33	A61-33	D58-33	D61-33
B18-33	B21-33	E18-33	E21-33
B28-33	B31-33	E28-33	E31-33
B38-33	B41-33	E38-33	E41-33
B48-33	B51-33	E48-33	E51-33
B58-33	B61-33	E58-33	E61-33
C18-33	C21-33	F18-33	F21-33
C28-33	C31-33	F28-33	F31-33
C38-33	C41-33	F38-33	F41-33
C48-33	C51-33	F48-33	F51-33
C58-33	C61-33	F58-33	F61-33

Voltage Jumpers

As above except pin 34 is used in all cases.

NOTE

If in any of the runs, pin 33 or pin 34 has a wire on it in the specified slot, choose a higher or lower number "slot" in the same row.

SECTION 5

H-316 OPTIONS

5.1	DETAILS OF OPTIONS
5.1.1	316 Basic Cables
5.1.2	316 PFI/PFH Mode Conversion
5.1.3	316-02 Additional Memory
5.1.4	316-0601 Extended Addressing Option
5.1.5	316-0602 Memory Expansion Option
5.1.6	316-0701/2 Memory Parity Option
5.1.7	316-0801/2 Memory Lockout Option
5.1.8	316-11 High Speed Arithmetic
5.1.9	316-12 Real Time Clock
5.1.10	316-1200 Real Time Clock (UK Version)
5.1.11	316-20 Standard DMC
5.1.12	316-21 High Speed DMC
5.1.13	316-25 Priority Interrupts
5.1.14	316-53/55 ASR-33/35 Package Interface

5.1 DETAILS OF OPTIONS

5.1.1 316 Basic Cables

Table 5-1 Basic Cables for 316 (Mainframe)

Item	Length	Description	Function	From	To	Drawing Number
1	12 ft.	Cable Assy. Pwr.	A. C. Input Mainframe	A3B1B	A. C. Source	42510313-003
2	7.5 ft.	Burndy to M. F.	Mainframe DC Pwr.	A3B2C	A1	42504482
3	7.5 ft.	Burndy to C. P.	Cont. Pnl. DC Pwr.	A3B2A	A24XC07 ...	70023838-701
4	45 in.	CC079 to C. P.	Cont. Pnl. Cbl. No. 1	A1AA17	Cont. Pnl.	70024016-701
5	45 in.	CC080 to C. P.	Cont. Pnl. Cbl. No. 2	A1AA18	Cont. Pnl.	70024010-701
6	2 ft.	upac to upac	Mem. Signal Cbl.	A1CA17	A1E608	70013826-701
7	2 ft.	upac to upac	Mem. Signal Cbl.	A1CA18	A1E607	70013826-701
8	23 ft.	QK Dis to Conn.	ASR Device Cbl.	A1D2XX05/06	Conn.	70015712-701
9	18/48 in.	QK Dis to Conn.	ASR Device Cbl.	Conn.	Device	70016729-701/702

Table 5-2 Basic Cables for 316 (Mainframe plus one Expansion Drawer)

Item	Length	Description	Function	From	To	Drawing Number
1	12 ft.	Cable Assy. Pwr.	A. C. Input Mainframe	A3B1B	A. C. Source	42510313-003
2	6 ft.	Cable Assy. Pwr.	A. C. Input Opt. Cab.	B2B1B	A3B4B	42510378-001
3	7.5 ft.	Burndy to M. F.	Mainframe DC Pwr.	A3B2C	A1	42504482
4	7.5 ft.	Burndy to Opt. Cab.	Opt. Cab. DC Pwr.	B3B2C	B1	42504482
5	7.5 ft.	Burndy to C. P.	Cont. Pnl. DC Pwr.	A3B2A	A24XC07 ...	70023838-701
6	7.5 ft.	Burndy to C. P.	Cont. Pnl. DC Pwr.	B3B2A	B24XC07 ...	70023838-701
7	45 in.	CC079 to C. P.	Cont. Pnl. Cbl. No. 1	A1AA17	Cont. Pnl.	70024016-701
8	45 in.	CC080 to C. P.	Cont. Pnl. Cbl. No. 2	A1AA18	Cont. Pnl.	70024010-701
9	2 ft.	upac to upac	Mem. Signal Cbl.	A1CA17	A1E608	70013826-701
10	2 ft.	upac to upac	Mem. Signal Cbl.	A1CA18	A1E607	70013826-701
11	23 ft.	QK Dis to Conn.	ASR Device Cbl.	A1D2XX05/06	Conn.	70015712-701
12	23 ft.	QK Dis to Conn.	ASR Device Cbl.	Conn.	Device	70016729

Table 5-3 Basic Cables for 316 (Mainframe plus two Expansion Drawers)

Item	Length	Description	Function	From	To	Drawing Number
1	12 ft.	Cable Assy. Pwr.	A. C. Input Mainframe	A3B1B	A. C. Source	42510313-003
2	6 ft.	Cable Assy. Pwr.	A. C. Input Opt. Cab.	B3B1B	A3B4B	42510378-001
3	6 ft.	Cable Assy. Pwr.	A. C. Input Opt. Cab.	C3B1B	B3B4B	42510378-001
4	7.5 ft.	Burndy to M. F.	Mainframe D. C. Power	A3B2C	A1	42504482
5	7.5 ft.	Burndy to Opt. Cab.	Opt. Cab. D. C. Power	B3B2C	B1	42504482
6	7.5 ft.	Burndy to Opt. Cab.	Opt. Cab. D. C. Power	C3B2C	C1	42504482
7	7.5 ft.	Burndy to C. P.	Cont. Panel D. C. Power	A3B2A	A24XC07 ..	70023838-701
8	7.5 ft.	Burndy to C. P.	Cont. Panel D. C. Power	B3B2A	B24XC07 ..	70023838-701
9	7.5 ft.	Burndy to C. P.	Cont. Panel D. C. Power	C3B2A	C24XC07 ..	70023838-701
10	45 in.	CC079 to C. P.	Cont. Panel Cbl. No. 1	A1AA17	Cont. Panel	70024016-701
11	45 in.	CC080 to C. P.	Cont. Panel Cbl. No. 2	A1AA18	Cont. Panel	70024010-701
12	2 ft.	upac to upac	Memory Signal Cbl.	A1CA17	A1E608	70013826-701
13	2 ft.	upac to upac	Memory Signal Cbl.	A1CA18	A1E607	70013826-701
14	23 ft.	QK Dis to Conn.	ASR Device Cable	A1D2XX05/06	Conn.	70015712-701
15	23 ft.	QK Dis to Conn.	ASR Device Cable	Conn.	Device	70016729

5.1.2 316 PFI/PFH Mode Conversion

mode:- Conversion from PFI (Power Failure Interrupt) mode to PFH (Power Failure Halt)

Delete: A1BA0924 to A1BA1118 (1)

Conversion from PFH mode to PFI mode:-

Add: A1BA0924 to A1BA1118 (1)

5.1.3 316-02 Additional 4K Memory Modules

Installation Time: Minimum 2 hours

Packages: As contained in a 1 x 3 option block

Installation Kit: One Kit 9153

Documentation: Wire List 70022845

Cables: Two jumper pacs 70014998-702
One '0' volt jumper 70024879-702 (black)
One +6 volt jumper 70024879-703 (red)
One +15 volt jumper 70024879-704 (grey)

Miscellaneous: The fifth 4K memory module connects to the memory expansion option 1 x 3 via two 2 foot cables, (refer to the Memory Expansion Option 316-0602).

Refer to the 316 Configuration Rules, section 3-2 for the mandatory position of these modules.

No cables require specifying on the SEP form.

5.1.4 316-0601 Extended Addressing Option

Installation Time: Minimum 3 hours

Packages: One CC-510, located in Mainframe position A1A15

Documentation: Option Manual 70130072276

Wire Changes:	Delete	D02FF+	A1AA0644	to	A1BA0419	(2)
		GNB15+	A1BA1508	to	A1BA1518	(2)
		M02FF+	A1BA0422	to	A1BA0620	(2)
		PMIND+	A1AA0602	to	A1AA1506	(2)
		PMIND+	A1AA0602	to	A1AA0605	(1)

Add	Y02FF-	A1CA1006	to	A1AA1406	(1)
	BSD02+	A1BA1508	to	A1AA0644	(2)
	BSH02-	A1AA1519	to	A1AA0629	(2)
	BSICY-	A1AA1507	to	A1AA0643	(2)
	EXTMD-	A1AA1514	to	A1BA1407	(2)
	H02DJ+	A1BA1521	to	A1BA1602	(2)
	M02DJ+	A1BA0422	to	A1BA1506	(2)
	PMIND+	A1AA1506	to	A1AA0605	(2)
	Y02FF-	A1AA0615	to	A1AA1406	(2)

5.1.5 316-0602 Memory Expansion Option

Installation Time: Minimum 2.5 hours

Prerequisite: 316-0601, 316-01 plus 3 x 316-02

Packages: As contained in a 1 x 3 expansion block

Installation Kits: One Kit 9153, two Kits 9154

Documentation: Option Manual 70130072276
Wire List 70025396

Cables: Two 70013826-701 (2 feet) to fifth 4K memory module
Two 70013826-715 (8 feet) Mainframe to Exp. Options

Miscellaneous: Refer to the 316 Configuration Rules, section 3-2 for the mandatory position for this option.

No cables require specifying on the SEP form.

5.1.6 316-0701/2 Memory Parity Option

Installation Time: Minimum 3 hours

Packages: As contained in a 1 x 3 option block, plus
One CC-558 or CC-621 located in Mainframe A1A16
One CC-510 located in Mainframe A1A15

Installation Kits: One Kit 9153, one Kit 9154

Documentation: Option Manual 70130072341
ICM-160 Manual 70130072233
Wire List 70025056

Cables: *Two 70013826-701 (2 feet) up to 16K memory
or
*Two 70014998-702 (7 inches) for over 16K of memory

Miscellaneous: Refer to the 316 Configuration Rules, section 3.2.3.

Wire Changes: Delete EPARB+ A1BA1628 to A1BA1418 (2)

If 16K or less of Memory Parity, make the following changes:-

Delete	GNA15+	A1BA1923	to	A1BA1927	(2)
	GNA15+	A1BA1923	to	A1AA1502	(1)
	GNC15+	A1BA1820	to	A1CA1533	(2)
	GNC15+	A1BA1820	to	A1BA1917	(1)

Add	MADCL-A	A1AA1030	to	A1BA1923	(2)
	MADCL-C	A1CA1820	to	A1BA1927	(2)
	RRCXX-	A1AA2025	to	A1BA1917	(2)
	GNC15+	A1BA1820	to	A1CA1533	(2)

If 16K or less of Memory Parity and no Extended Addressing make the following changes:-

Delete	MEMC1+	A1BA0910	to	A1CA1032	(2)
	MEMC1+	A1BA0910	to	A1AA1529	(1)
Add	MEMC1+	A1BA0910	to	A1CA1032	(2)

* Items required to be specified on the SEP form.

5.1.7 316-0801/2 Memory Lockout Option

Installation Time: Minimum 3 hours

Packages: One CC-558 pac located in mainframe A1A16
As contained in a 1 x 3 option block (up to 16K)
or
As contained in a 2 x 3 option block (over 16K)

Installation Kits: One Kit 9153 (for 1 x 3 block)
Two Kits 9153 (for 2 x 3 block)

Documentation: Option Manual 70130072309
Wire List 70026104 (for 1 x 3 block)
or
Wire List 70028042 (for 2 x 3 block)

Cables: *Two I/O jumpers 70014998-702 (7 inches)
or
Two cables 70013826-701 (2 feet)
One cable 70026981-701 (12.5 inches) from
A1CA16 to A1E18

Miscellaneous: *Cables to be specified on the SEP form

Wire Changes: Delete YNODE- A1BA1420 to A1BA1515 (2)
FCYSO- A1AA0526 to A1AA0520 (2)
ICYEF- A1AA0528 to A1BA0524 (2)

Add ICYSI- A1AA0528 to A1CA1612 (2)
LXACY- A1AA0521 to A1BA1639 (2)
YNODE- A1BA1420 to A1CA1604 (2)

The following two wires must be deleted unless only Sector Zero Relocation is ordered. Sector Zero Relocation requires the CC558 pac only (No 1 x 3).

Delete	MELOV+	A1BA0918	to	A1AA0920	(2)
	RESTR+	A1BA1618	to	A1BA1643	(2)

5.1.8 316-11 High Speed Arithmetic

Installation Time: Minimum 2.5 hours

Packages: One CC-401 located in mainframe A1A11
One CC-375 located in mainframe A1A12

Documentation: Option Manual 70130072168

Wire Changes: Delete SRSTL+ A1AA1202 to A1AA1110 (2)
DIVOP+G A1CA1133 to A1CA1105 (2)
DPMOD+ A1AA1102 to *A1AA1128 (2)

*A1AA1102 may be wired to A1BA0424 (2)

5.1.9 316-12 Real Time Clock

Installation Time: Minimum 2 hours

Packages: One CC-344 located in mainframe A1BA17

Documentation: Option Manual 70130072179

Wire Changes: Delete	RCENB+	A1AA0802	to	A1AA0818	(2)
	RDINH-	A1AA0823	to	A1BA0718	(2)
	RTCLK+	A1AA0921	to	A1AA0902	(2)

5.1.10 316-1200 Real Time Clock (UK Version)

Installation Time: Minimum 2.5 hours

Packages: One NC-023 located in mainframe A1BA17

Documentation: Option Manual 42401226-100

Installation Kit: *One 42504411-001 Bracket (required if System shipped before April 1970)

Cables: *Two 940052-700 (24 inches) with two 941570-001 terminals per wire (required if System shipped before October 1970).
*Runs 26 and 27 added to 42504482-001 (10 feet)
Mainframe DC power cable (required if System shipped before June 1970)

Miscellaneous: *Items to be specified on the SEP form if required

Wire Changes: Delete RCENB+ A1AA0802 to A1AA0818 (2)
RDINH- A1AA0823 to A1BA0718 (2)
RTCLK+ A1AA0921 to A1AA0902 (2)

5.1.11 Standard DMC

Installation Time: Minimum 4.5 hours

Packages: As contained in a 2 x 3 option block

Installation Kits: Two Kits 9153
One Kit 9154

Documentation: Option Manual 70130072180
Wire List 70025520

Cables:

Qty.	Part Number	From	To	Signal
4	70014998-702 (7 inches)	A1AA20 A1AA19	A1A401 A1A402	DMC
		A1BA20 A1CA20	A1B401 A1C401	I/O Bus

*One 70014989-xxx (25 feet) if no DMC sub channels
*One 70013826-xxx (2 feet, 8 feet or 12.5 feet) if sub channel used

Miscellaneous: The DMC must be located adjacent to the CP reference section 3.2.5

Standard DMC is supplied with 4 channels. One, two or three CC-044 pacs are required to increase this to 8, 12 or 16 channels.

*Cable lengths and additional CC-044 pacs to be specified on the SEP form if required. Refer to section 3.3.6.

Wire Changes: Delete

EOINS-	A1BA0532	to	A1BA1713	(2)
EOINS-	A1AA2011	to	A1BA1713	(1)
IYB09+	A1BA0705	to	A1AA0702	(2)
NRMOP+	A1BA0413	to	A1CA1112	(2)
RTCEN-	A1BA1715	to	A1BA0906	(1)
TL2FF+	A1BA0804	to	A1BA1043	(2)
TL2FF+	A1AA0908	to	A1BA0804	(1)
TL2FF-	A1BA0843	to	A1CA0501	(2)
TL2FF-	A1BA0843	to	A1AA1413	(1)
TL3FF+	A1BA0903	to	A1AA0938	(2)

Add

ACYLF-	**A1AA1616	to	C2222 in the DMC	(2)
BREAK-	A1CA0932	to	B2131 in the DMC	(2)
DMRRL+	A1AA2032	to	A1AA0938	(2)
EOINS-	A1BA0532	to	A1AA2011	(1)
ICYLF+	A1AA1516	to	B2126 in the DMC	(2)
IG063-	*A1CA1931	to	B2123 in the DMC	(2)
IOGRP-	A1BA0932	to	C2224 in the DMC	(2)
IRSOP+	A1AA0545	to	B2124 in the DMC	(2)
NRMOP+	A1BA0413	to	A2506 in the DMC	(1)
NRMOP+	A1CA1112	to	A2527 in the DMC	(2)
RPTT2+	A1BA0805	to	B1327 in the DMC	(2)
RRCXX+	A1BA1007	to	C2229 in the DMC	(2)
RTCCL-	A1BA1713	to	C2227 in the DMC	(1)
RTCEN-A	A1BA1715	to	B2125 in the DMC	(1)
SCZRO+	A1BA0519	to	C2230 in the DMC	(1)
TL2FF+	A1BA0804	to	A1BA1043	(2)
TL2FF-	A1CA0501	to	A1AA1413	(1)
TL4FF+A	A1BA0937	to	B1511 in the DMC	(2)
T2DMC+	A1AA0908	to	B2118 in the DMC	(2)
T2DMC-	A1BA0843	to	B2128 in the DMC	(2)

*On early CP's IG063- may be found on A1CA1930

**On early CP's ACYLF may be found on A1BA0504

5.1.12 316-21 High Speed DMC

Installation Time:

Minimum 4.5 hours

Packages:

As contained in a 3 x 3 option block

Installation Kits:

Three Kits 9153
One Kit 9154

Documentation:

Option Manual 70130072280
Wire List 70024837

Cables:

Qty.	Part Number	From	To	Signal
4	70014998-702	A1AA20	A1A401	DMC
	(7 inches)	A1AA19	A1A402	DMC
		A1BA20	A1B401	I/O Bus
		A1CA20	A1C401	I/O Bus

*One 70014989-xxx (25 feet) if no DMC sub channels

*One 70013826-xxx (2 feet, 8 feet or 12.5 feet) if DMC sub channels used.

Miscellaneous:

The DMC must be located adjacent to the CP reference section 3.2.5

To expand from 8 to 16 DMC channels the following micropacs are required:

Two IM-336 micropacs
One DG-336 micropac
One TG-335 micropac
One DI-335 micropac
One BR-335 micropac
Two CC-044 micropacs
One PA-336 micropac

*Cable lengths required to be specified on the SEP form reference section 3.3.6

Wire Changes: Delete

EOINS-	A1BA0532	to	A1BA1713	(2)
EOINS-	A1AA2011	to	A1BA1713	(1)
IYB09+	A1BA0705	to	A1AA0702	(2)
NRMOP+	A1BA0413	to	A1CA1112	(2)
RTCEN-	A1BA1715	to	A1BA0906	(1)
TL2FF+	A1BA0804	to	A1BA1043	(2)
TL2FF+	A1AA0908	to	A1BA0804	(1)
TL2FF-	A1BA0843	to	A1CA0501	(2)
TL2FF-	A1BA0843	to	A1AA1413	(1)
TL3FF+	A1BA0903	to	A1AA0938	(2)

Add

ACYLF-	**A1AA1616	to	C3716 in the HSDMC	(2)
BREAK-	A1CA0932	to	A2131 in the HSDMC	(2)
DMRRL+	A1AA2032	to	A1AA0938	(2)
EOINS-	A1BA0532	to	A1AA2011	(1)
ICYLF+	A1AA1516	to	A2126 in the HSDMC	(2)
IG063-	*A1CA1931	to	A2123 in the HSDMC	(2)
IOGRP-	A1BA0932	to	C3718 in the HSDMC	(2)
IRSOP+	A1AA0545	to	A2124 in the HSDMC	(2)
NRMOP+	A1BA0413	to	A2506 in the HSDMC	(1)
NRMOP+	A1CA1112	to	A2527 in the HSDMC	(2)
RPTT2+	A1BA0805	to	B1327 in the HSDMC	(2)
RRCXX+	A1BA1007	to	C3710 in the HSDMC	(2)
RTCCL-	A1BA1713	to	C3720 in the HSDMC	(1)
RTCEN-A	A1BA1715	to	A2125 in the HSDMC	(1)
SCZRO+	A1BA0519	to	C3719 in the HSDMC	(1)
TL2FF+	A1BA0804	to	A1BA1043	(1)
TL2FF-	A1CA0501	to	A1AA1413	(1)
T2DMC+	A1AA0908	to	A2118 in the HSDMC	(2)
T2DMC-	A1BA0843	to	A2128 in the HSDMC	(2)
TL4FF+A	A1BA0937	to	C3711 in the HSDMC	(2)

*On early CP's IG063- may be found on A1CA1930

**On early CP's ACYLF- may be found on A1BA0504.

5.1.13 316-25 Priority Interrupt Option

Installation Time:

Minimum 3.5 hours

Wire Changes: Delete

IG067+	A1BA0822	to	A1BA0818	(2)
IG107+	A1CA0813	to	A1CA0833	(2)
IG127+	A1CA0805	to	A1CA0733	(2)

Add the following wires when PI is not installed

A1CA1929	to	A1CA1932
A1BA0911	to	A1BA0936

This ties SEXRQ+ to PIREQ+ to IG063-

NOTE

Refer to common option X16-25 (section 7.1.1) for all other details of this option.

5.1.14 316-53/55 ASR-33 or 35 Teletype (Package Interface)

Installation Time: Minimum 4 hours

Packages: One CC-374 located in mainframe position A1A01

Installation Kits: One Kit 9154
One Transformer 42504031 (not required for KODE)

Documentation: Vendor Device Manuals

Cables: One 42510313-001 (6 feet) Device Power Cable (not required with KODE device)
One 70015712-701 (23 feet) Device Signal Cable

Device: One ASR-33
or
One ASR-35

Miscellaneous: Additional devices will require X16-53/55 (1 x 3 interface block).

SECTION 6

DDP 416/516 OPTIONS

6.1 DETAILS OF OPTIONS

6.1.1 Basic Cables, Single Bay System
6.1.2 Basic Cables, Double Bay System
6.1.3 Basic Cables, Treble Bay System
6.1.4 416/516 Memory Modules
6.1.5 516-05/06 Memory Expansion Option
6.1.6 416/516-07 Memory Parity Option
6.1.7 416/516-08 Memory Lockout Option
6.1.8 516-11 High Speed Arithmetic
6.1.9 416/516-12 Real Time Clock
6.1.10 416/516-20 DMC Option
6.1.11 416/516-21 DMA Option

6.1 DETAILS OF OPTIONS

6.1.1 Basic Cables, Single Bay System

Table 6-1 Basic Cables for 416/516 (One Bay)

Item	Length	Description	Function	From	To	Drawing Number
1	18 ft.	upac to upac	Console Cable	CC079	A1E38	C-015055-701
2	18 ft.	upac to upac	Console Cable	CC080	A1D38	C-015057-701
3	17 ft.	Amphenol to Amphenol	AC/DC Power (C1)	Z2XA1..	A25D1..	A-014550-701
4	5 ft.	Amph. to QK. Dis.	AC/DC Power (C2)	A1K1...	A25C1..	A-014556-701
5	30 in.	QK. Dis. to QK. Dis.	AC/DC Power (C4)	A3A....	A1K1...	A-014556-701
6	15 ft.	QK. Dis. to QK. Dis.	AC/DC Power (C5)	Z2X....	A3A....	A-014554-701
7	36 in.	QK. Dis. to QK. Dis.	AC/DC Power (C6)	A3A3....	A25....	A-014553-701
8	42 in.	QK. Dis. to QK. Dis.	AC/DC Power (C7)	A3A1....	A4K1....	A-014553-701
9	5 ft.	Elco to Elco	AC/DC Power (C11)	A21A....	A1H1B..	A-014551-701
10	70 in.	Elco to Elco	AC/DC Power (C12)	A1E58	A4C68	A-014551-702
11	56 in.	upac to upac	Mem. Signal Cable	A1F61	A4C67	A-014997-703
12	52 in.	upac to upac	Mem. Signal Cable	A25A101	A4K1Q01	A-014552-702
13	5 ft.	QK. Dis. to QK. Dis.	24 V (ASR Power Cable)	A4K1K01/P01	Jones Conn.	A-01712-701
14	23 ft.	Jones to Device	ASR Device Cable	Jones Conn.	ASR Device	A-016729
15		upac to upac	ASR Device	A1C21	A5C68	A-013826-714
16	6.5 ft.	upac to upac	M. F. I/O To	A1B21	A5B68	A-015294-701
17	6.5 ft.	upac to upac	M. F. I/O To			A-015294-701
18	10 ft.	Transformer Cable				A-017918-701
19	10 ft.	Transformer Cable				
20						

6.1.2 Basic Cables, Double Bay System

Table 6-2 Basic Cable for 416/516 (Two Bays without B3 and B4)

Item	Length	Description	Function	From	To	Drawing Number
1	18 ft.	upac to upac	Console Cable	CC079	A1E38	C-015055-701
2	18 ft.	upac to upac	Console Cable	CC080	A1D38	C-015057-701
3	17 ft.	Amphenol to Amphenol	AC/DC Power (C1)	Z2XA1..	A25D1..	A-014550-701
4	5 ft.	Amph. to QK. Dis.	AC/DC Power (C2)	A1K1...	A25C1..	A-014556-701
5	30 in.	QK. Dis. to QK. Dis.	AC/DC Power (C4)	A3A....	A1K1....	A-014556-701
6	15 ft.	QK. Dis. to QK. Dis.	AC/DC Power (C5)	Z2X....	A3A....	A-014554-701
7	36 in.	QK. Dis. to QK. Dis.	AC/DC Power (C6)	A3A3....	A25....	A-014552-701
8			AC/DC Power	A3A....		A-014553
9						
10	5 ft.	Elco to Elco	AC/DC Power (C11)	A21A...	A1H1B..	A-014551-701
11	70 in.	Elco to Elco	AC/DC Power (C12)	A21A...	A4H1B..	A-014551-702
12	120 in.	Hubble to Hubble	AC/DC Power (C17)	B631E	A21B4..	A-015500-701
13	90 in.	Elco to Elco	AC/DC Power (C19)	B1H1B..	A21A...	A-014551-703
14						
15	38 in.	QK. Dis. to QK. Dis.	AC/DC Power (C25)	B5A....	B1K1...	A-014556-702
16						
17						
18						
19						
20						
21						
22	51 in.	upac to upac	Mem. Signal Cable	A1F61	A4C67	A-014997-703
23						
24	56 in.	upac to upac	Mem. Signal Cable	A1E58	A4C68	A-014997-701
25			24 V (ASR Power Cable)	A25A101	K1Q01	A-014552
26	23 ft.	QK. Dis. to QK. Dis.	ASR Device Cable	K1K01/P01	Jones Conn.	A-015712-701
27		Jones to Device	ASR Device	Jones Conn.	ASR Device	A-016729
28		upac to upac	M. F. I/O To	A1C21	A-013826	A-013826
29		upac to upac	M. F. I/O To	A1B21	A-015294-701	A-015294-701
30	10 ft.	Transformer Cable				A-017918-701
31	10 ft.	Transformer Cable				
32						
33						

6.1.3. Basic Cables, Treble Bay System

Table 6-3 Basic Cables for 416/516 (Three Bays without C3 and C4)

Item	Length	Description	Function	From	To	Drawing Number
1	18 ft.	upac to upac	Console Cable	CC079	A1E38	C-015055-701
2	18 ft.	upac to upac	Console Cable	CC080	A1D38	C-015057-701
3	17 ft.	Amphenol to Amphenol	AC/DC Power (C1)	Z2XA1..	A25D1..	A-014550-701
4	5 ft.	Amph. to QK. Dis.	AC/DC Power (C2)	A1K1...	A25C1...	A-014555-701
5	30 in.	QK. Dis. to QK. Dis.	AC/DC Power (C4)	A3A....	A1K1...	A-014556-701
6	15 ft.	QK. Dis. to QK. Dis.	AC/DC Power (C5)	Z2X....	A3A....	A-014554-701
7	36 in	QK. Dis. to QK. Dis.	AC/DC Power (C6)	A3A3...	A25....	A-014552-701
8		QK. Dis. to QK. Dis.	AC/DC Power	A3A....		A-014553
9						
10	5 ft.	Elco to Elco	AC/DC Power (C11)	A21A...	A1H1B..	A-014551-701
11	70 in.	Elco to Elco	AC/DC Power (C12)	A21A...	A4H1B..	A-014551-702
12	120 in.	Hubble to Hubble	AC/DC Power (C17)	B631E..	A21B4..	A-015500-701
13	12 ft.	Hubble to Hubble	AC/DC Power (C18)	C631E..	A21B7..	A-015500-702
14	90 in.	Elco to Elco	AC/DC Power (C19)	B1H1B..	A21A...	A-014551-703
15	90 in.	Elco to Elco (C20)	AC/DC Power (C20)	B3H1B..	A21A...	A-014551-703
16	112 in.	Elco to Elco (C21)	AC/DC Power (C21)	C1H1B..	A21A...	A-014551-704
17						
18	30 in.	QK. Dis. to QK. Dis.	AC/DC Power (C23)	B5A....	B3K1...	A-014556-701
19						
20	38 in.	QK. Dis. to QK. Dis.	AC/DC Power (C25)	B5A....	B1K1...	A-014556-702
21	38 in.	QK. Dis. to QK. Dis.	AC/DC Power (C26)	C5A....	C1K1...	A-014556-702
22						
23						
24						
25						
26	51 in.	upac to upac	Mem. Signal Cable	A1F61	A4C87	A-104997-703
27						
28						
29	56 in.	upac to upac	Mem. Signal Cable	A1E58	A4C68	A-014997-701
30		QK. Dis to QK. Dis..	24 V (ASR Power Cable)	A25A101	K1Q01	A-104552
31	23 ft.	Jones to QK. Dis.	ASR Device Cable	K1K01/P01	Jones Conn.	A-015712-701
32		Jones to Device	ASR Device Cable	Jones Conn.	ASR Device	A-016729
33		upac to upac	M. F. I/O To	A1C21		A-013826
34		upac to upac	M. F. I/O To	A1B21		A-013826
35	10 ft.	Transformer Cable				A-015294-701
36	10 ft.					A-017918-701
37						
38						

6.1.4 416/516 Memory Modules

Installation Time: Minimum 4.5 hours per drawer

Packages: One TG-335 for expansion from 4K or 8K to 12K or 16K only

NOTE

Refer to section 4.3.1, Tables 4-4 and 4-5 for this option.

6.1.5 516-05/06 Memory Expansion Option

Installation Time: Minimum 3.0 hours

Packages: Required for expansion from 16K to 24K are as follows:

*Ten CC-045
One CC-085
One TG-335
Two CC-073
One DN-335
One DI-335
One DL-335

Required for expansion from 24K to 32K are as follows:

One TG-335

Documentation: Option Manual 70130071646

Miscellaneous: Additional Memory drawers; refer to sections 4.3.1 and 4.3.2

Additional Cables; refer to Tables 4-4 and 4-5

*Six CC-045 micropacs are shared with DMA and
Two CC-045 micropacs with Memory Parity

Wire Changes:

- ✓ Remove Ground from A1F3226 (enables P02BS+)
- ✓ Remove Ground from A1F3207 (enables EXTMD+)
- ✓ Remove Ground from A1D4128 (enables Y02FF+)
- ✓ Delete M02FF+ from A1E3407 to A1F5202 (2)
- ✓ Add M02DJ+ from A1E3407 to A1F3215 (2)

Remove CC-054 pacs in A1E52 and A1E57

6.1.6 416/516-07 Memory Parity Option

Installation Time: Minimum 4.5 hours per drawer

416 Packages: One DI-335
Four DG-336
One CC-045
Two CC-073 (one shared with DMA)

516 Packages: One DI-335
Four DG-336
One CC-073
Three CC-045 (two shared with Memory Expansion)

Documentation: Option Manual 70130071652
Wire List 70009538

Miscellaneous: Memory drawers must be of the 17 bit parity type
Refer to section 4.3.3

Wire Changes: Remove Ground from A1D2603 (enables MPEFF+)

6.1.7 416/516-08 Memory Lockout Option

Installation Time: Minimum 5 hours

Packages (Mainframe): Basic 8K of MLO
One CC-089
Two OD-335
One DG-335
One TG-335
Two DN-335
One CM-022
Two CC-045
One DL-335
Two DG-336

Additional Packages: For 16K MLO: Two DG-336
For 24K MLO: Two DG-336
For 32K MLO: Two DG-336

Packages (Option): Up to 24K MLO, as contained in 1 x 3 option block
Up to 32K MLO, as contained in 2 x 3 option block

Installation Kits: 8K MLO: One kit 9153 and one kit 9154
16K MLO: One kit 9153 and one kit 9154
24K MLO: One kit 9153 and two kits 9154
32K MLO: Three kits 9153 and three kits 9154

Documentation: Option Manual 42400343-503
Wire List 70013941

Cables: *Two I/O jumpers 70014998-701 (6 inches)
or
Two cables 70013826-xxx
*One cable 70013826-xxx from A1A51 to XXA11,
for 8K of MLO
*One cable 70013826-xxx from A1A58 to XXA18,
for 16/24K of MLO
*One cable 70013826-xxx from A1A61 to XXA21,
for 32K of MLO

Miscellaneous: Refer to section 4.3.4 and Table 4-6

*Cable lengths to be specified on the SEP form if required

Wire Changes: Remove Ground from A1E2610 (enables MELOV+)
Remove Ground from A1D2508 (enables RESTR+)
Remove A1B5605 to A1B5613 (enables Index Register
when Sector 'O' is relocated)

Delete	FCYS0-	A1B3515	to	A1B3214	(2)
	ICYEF-	A1B3226	to	A1A2712	(2)
Add	ICYSI-	A1B3226	to	A1B3731	(2)

If 24K or 32K of memory and only 16K of memory
lockout add the following wires to the option block:

XXA1325	to	XXA1332
XXA1332	to	XXA1333

6.1.8 516-11 High Speed Arithmetic Option

Installation Time: Minimum 3.5 hours

Packages: One CC-045
Three DC-335
Six DL-335
One TG-335
Three DN-335
Two DI-335
Four CM-022

Documentation: Option Manual 70130071648

6.1.9 416/516-12 Real Time Clock

Installation Time: Minimum 2.5 hours

Packages: One CC-468
One CC-089
One DI-335
One DL-335

Documentation: Option Manual 70130071657

Wire Changes: Remove Ground from A1E2605 (enables Clock Interrupt)

6.1.10 416/516-20 DMC

Installation Time: Minimum 4 hours

Packages: As contained in a 1 x 3 option block plus
Two TG-335
One PA-336
One CM-022

Installation Kits: One Kit 9153
One Kit 9154

Documentation: Option Manual 70130071647
Wire List 70013819

Cables: One jumper pac 70014998-701 (6 inches) A1A18 to A1A21
One jumper pac 70014998-702 (7 inches) A1A17 to A1A22
*One cable 70014989-xxx (25 feet) if no DMC subchannels
*One cable 70013826-xxx if a DMC subchannel supplied

Miscellaneous: Refer to section 4.3.5

*Required cable and length to be specified on SEP

Refer to section 4.4.4 and Table 4-6 for cable lengths

Wire Changes:

Remove CC-054 in A1C42
Disable unused DMC channels

6.1.11 416/516-21 DMA

Installation Time:

Minimum 5 hours

Packages:

As contained in a 2 x 3 option block (1 - 3 channels)
or
As contained in a 3 x 3 option block (4 channels).

Mainframe Packages:

One CC-044
Three DI-335
Three CC-153
Two PA-336
Thirteen CC-045
One CC-089
Two CC-154
Two CC-073
Eight TG-335
One CM-022

Installation Kits:

Two Kits 9153 and two Kits 9154 (for 2 x 3 option block)
or
Three Kits 9153 and three Kits 9154 (for 3 x 3 option block)

Documentation:

Option Manual 70130071649
Wire List 70013940

Cables:

Qty	Part Number	Description
*2	70013826-xxx	A1F18 to XXC21 (Act Lines) A1F11 to XXA21 (DIL's/ DAL's, etc) <i>XXA28 Rev F.</i>
*2	70013826-xxx	From A1D18 and A1E18 (DMA Bus Cables)
*2	70013826-xxx	(I/O Bus link to external DMA)
*1	70013826-xxx	(DIL/DAL lines to options on DMA, if in different tilt-out drawer)
*1	70014989-(25 ft)	(If not options on DMA)

Miscellaneous:

Refer to sections 4.3.6 and 4.4.5 for details of this option

*Required cables and lengths to be specified on SEP

Reference Figure 4-6 and Table 4-6

Wire Changes:

Remove CC-054's in A1F52, A1E52 and A1E57
Disable unused DMA channels.

SECTION 7

COMMON SERIES 16 OPTIONS

7.1

INTRODUCTION

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7.0 INTRODUCTION

This section contains both current and obsolete options. For further information concerning currently available options refer to the Series 16 Summary Manual or to Marketing Administration.

7.1.1 X16-25 /26 Priority Interrupt Option

Installation Time:	Minimum 4 hours
Packages:	As contained in a 1 x 3 option block (for up to 16 lines) As contained in a 2 x 3 block (for 17 to 48 lines).
	1 x DL-335) 416 /516 only (Mainframe Pac's) 1 x PA-336)
Installation Kit:	1 kit 9153 and 1 kit 9154 (for 1 x 3 option block) 2 kits 9153 and 2 kits 9154 (for 2 x 3 option block)
Documentation:	Option Manual 70130071644 Wire List 70015049
Cables:	*2, I/O Jumper Pacs 70014998-xxx or 2, cables 70013826-xxx *1, cable 70013826-xxx (from Mainframe to P. I. Option). *1, cable 70014989-xxx (25 ft.) for first 16 lines *1, cable 70014989-xxx (25 ft.) for lines 17 to 32 *1, cable 70014989-xxx (25 ft.) for lines 33 to 48
Miscellaneous:	*Refer to Table 4-6 for 416 /516 or Table 3-5 for 316 cable lengths *Required cables and lengths to be specified on the SEP form

7.1.2 X16-29 OCP /SKS Option

Installation Time:	Minimum 3.5 hours
Packages:	As contained in a 1 x 3 option block
Installation Kit:	1 kit 9153 and 1 kit 9154
Documentation:	Option Manual 70130071821 Wire List 70017936
Cables:	*2, I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx 1, Device cable 70014989-xxx (25 ft.)
Miscellaneous:	*Refer to Table 4-6 for 416 /516 or Table 3-5 for 316 cable lengths *Required cables and lengths to be specified on the SEP form

7.1.3 X16-32 /33 Parallel Input /Output Channel

Installation Time:	Minimum 3.5 hours
Packages:	As contained in a 1 x 3 option block

Additional Packages: For option 316-32/33-6 (DMC Sub-channel) or:-
516-32/33-8 (DMA Sub-channel) :-
1 x SL-335 and 1 x CC-089

For option 316-32/33-7 (DMC auto switch channel) :-
1 x DL-335, 1 x CC-089 and 1 x DI-335

If DMC or DMA sub-channels are ordered with the basic option, these packages will be contained in the 1 x 3 option block.

Installation Kit: 1 kit 9153 and 1 kit 9154
An additional kit 9154 is supplied with the DMC/DMA sub-channel

Documentation: Option Manual 70130071721
Wire List 70017848

Cables: *2, I/O Jumper Pacs 70014998-xxx or 2 cables 70013826-xxx
*1, Device cable 70014989-xxx (25 ft.)
* DMC/DMA cable 70013826-xxx (required if option is the only one on DMC/DMA in the option drawer)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Required cables and lengths to be specified on the SEP

7.1.4 X16-34 Buffered Parallel I/O Channel

Installation Time: Minimum 3.5 hours

Packages: 316-34, as contained in a 2 x 3 option block (Includes I/O or DMC channels)
516-34, as contained in a 1 x 3 option block
516-34 plus DMC or DMA channels - as contained in a 2 x 3 option block

Installation Kit: 2 kits 9153 and 2 kits 9154

Documentation: Option Manual 70130071722
Wire List for 1 x 3 Block 70016245
Wire List for 2 x 3 Block 70016712

Cables: *2, I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
2, Device cables 70014989-xxx (25 ft.)
*1, DMC/DMA cable 70013826-xxx (required if option is the only one on DMC/DMA in the option drawer).

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths.
*Required cables and lengths to be specified on the SEP

7.1.5 X16-53/55 ASR-33 or ASR-35 Teletype

Installation Time: Minimum 4.5 hours

Packages: As contained in a 1 x 3 option block

Peripherals: X16-53: One ASR-33
X16-55: One ASR-35

Installation Kit: 1 kit 9153 and 1 kit 9154
1 Transformer, 42504031 H316 only (not required for KODE)

Documentation: Vendor Manuals
Wire List 70014811

Cables: *2, I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
1, cable 70015712-701 (23 ft.) (Device Signal)
1, cable 42510313-001 (6 ft.) Device Power, 316 only (not required if KODE ASR)
*1, cable 70014552-xxx (24 volt) for 516 only. Refer to Table 4-5 for length

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for cable lengths
*Required cables to be specified on the SEP form

7.1.6 X16-2120 Series Incremental Plotter

Installation Time: Minimum 4.5 hours

Device: Option 2121 C.I. Plotter Model 141
Option 2122 C.I. Plotter Model 142
Option 2123 C.I. Plotter Model 341
Option 2124 C.I. Plotter Model 342

Packages: As contained in a 1 x 3 option block (16-2125)
316 (Rack Mounting) Power Supply 41262563-001
316 (Table Top) Power Supply 41201654-001 (16-2129)
416/516 Power Supply 41262563-002

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: Option Manual 41286101090
Wire List 41260205-001
Computer Instrumentation Device Manual

Cables: *2, I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
Device cable 41260239-001 (30 ft.)
Interface Power cable (6½ ft.)
Plotter Mains cable (10 ft.)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Cables to be specified on the SEP form

7.1.7 X16-2221/2 CRT Plotter Display

Installation Time: Minimum 4.5 hours

Device: Tektronix RM 503 CRT Display

Packages: As contained in a 2 x 3 option block

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: Option Manual 41285348001
Wire List 41260905001 (included in Option Manual)
Vendor Device Manual

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
1, Device cable 41260299-001 (10 ft.)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Cables and lengths to be specified on the SEP form

7.1.8 X16-2223/4 CRT Plotter Display

Installation Time: Minimum 4.5 hours

Device: Data Display type 419D-R-PT

Packages: As contained in a 2 x 3 option block

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: Option Manual 41285349-001
Vendor Device Manual (LAN Electronics)

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
1, Device cable 41260903-001 (10 ft.)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 Cable lengths
*Cables and lengths to be specified on the SEP form

7.1.9 X16-2230 Series Storage Tube Display

Installation Time: Minimum 4.5 hours

Peripheral: Tektronix Type 611 Storage Tube Display. Option 2232
Vertical format or option 2233 horizontal format

Packages: As contained in a 2 x 3 option block (Option 2231)

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: Option Manual 41286101015
Tektronix 611 Display Manual

Cables: *2, I/O Bus Jumpers 70014998-xxx or 2 cables 70013826-xxx
Device cable 41260646-001 (50 ft.)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Cables and lengths to be specified on the SEP form

7.1.10 X16-2810 Series Time Multiplexer Unit

Installation Time: Minimum 6 hours

Packages: Option 2812 TMU, as contained in a 3 x 3 option block
Option 2813 AAR's up to 4 contained in option 2812 3 x 3 option block

Installation Kit: 1 kit 9153 and 6 kits 9154

Documentation: Option Manual 41285608001

Cables: CPI: *2, I/O cables 70013826-xxx
*1, DMC/DMA cable 70013826-xxx (if required)
*1, Priority Interrupt cable 70013826-xxx (if required)

CP2: *2, I/O cables 70013826-xxx
*1, DMC/DMA cable 70013826-xxx (if required)
*1, Priority Interrupt cable 70013826-xxx (if required)

Miscellaneous: *State the device which the TMU will control on the SEP form
CPI: local CP i.e. in same rack or bay
CP2: remote CP i.e. in adjacent rack or bay.
DMC/DMA signals between TMU and device controller are hand wired
*Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Cables and lengths to be specified on the SEP form if required

7.1.11 X16-2820 Series Inter Computer Communications Unit (ICCU)

Installation Time: Minimum 7 hours

Packages: As contained in a 2 x 3 option block

Installation Kit: 1 kit 9153 and 6 kits 9154

Documentation: Option Manual 41285497001

Cables: CPI: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
*1, DMC/DMA cable 70013826-xxx (if required)
*1, Priority Interrupt cable 70013826-xxx (if required)

CP2: *2, I/O cables 70013826-xxx
*1, DMC/DMA cable 70013826-xxx (if required)
*1, Priority Interrupt cable 70013826-xxx (if required)

Miscellaneous: CPI: local CP i.e. in same rack or bay
CP2: remote CP i.e. in adjacent rack or bay
*Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
Cables and lengths to be specified on the SEP form is required

7.1.12 X16-2910 One Meg. Word Disc File (SDSI)

Installation Time: Minimum 8.5 hours

Device: One SDSI Fixed Head Disc (16-2913)

Packages: As contained in a 4 x 3 option block (16-2911 Multiplexer for a maximum of 2 extra discs, as contained in an additional 1 x 3 option block (16-2912)

Installation Kit: 2 kits 9153 and 1 kit 9154
4 additional kits 9154 supplied with the 16-2912 and two discs

Documentation: Option Manual 41286101012
Vendor Manuals

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
*1, DMC/DMA cable 70013826-xxx (required if option is the only one on DMC/DMA in the option drawer)
Device cable 41262741-001 (35 ft.) 1 per disc unit
Device power cable 41263735-001 (35 ft.) 1 per disc unit

Additional cables for Multiplexer Unit 16-2912 :-
*2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
*2, cables 70013826-xxx (Multiplexer to Controller)

Miscellaneous: H316-20/21 requires the DMC/HSDMC enhancement
*Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Cables and lengths to be specified on SEP form if required
Ensure that a 3 phase supply is available for this option

7.1.13 X16-3001 to 3006 HADIOS Data Highway

Installation Time: Minimum 2 hours

Physical:

Option	μ block size	Number of Highway Slots
X16-3001	1 x 3	8
X16-3002	2 x 3	16
X16-3003	3 x 3	24
X16-3004	4 x 3	32
X16-3005	5 x 3	40
X16-3006	6 x 3	48

Installation Kit: X16-3001, 2, 3: 1 kit 9153
X16-3004, 5, 6: 2 kits 9153

Documentation: Option Manual 41286101087

NOTE

These options cannot be connected together to expand a Data Highway

7.1.14 X16-3007 HADIOS Data Highway Expansion Block

Installation Time: Minimum 2 hours

Physical: One 1 x 3 microblock Highway extension
(Provides 6 extra slots in the Data Highway)

Installation Kit: 1 kit 9153

Prerequisites: One X16-3008 and one X16-3001 to 6

NOTE

Maximum size of an expanded Data Highway is 6 x 3 and must consist of a continuous row without the use of cables.

7.1.15 X16-3008 HADIOS Jumper Pacs

Three Jumper Pac's 70014998-702 7 inches (to link option 3007 to the Data Highway).

7.1.16 X16-3011, 12 HADIOS Controllers

Installation Time: Minimum 1 hour

Packages: X16-3011: 1, HC400H controller for I/O Bus mode.
X16-3012: 1, HC401H controller for I/O or DMC mode

Documentation: Option Manual 41286101087
Sub Interface Manual 41286101088 (if a sub interface is supplied)

Cables: *2, I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
*1, DMC cable 70013826-xxx if required (for option 3012 only)

Prerequisite: Hados Data Highway (X16-3001 to 6)
DMC or HSDMC (for option 3012 only)

Miscellaneous: Controller requires 4 slots in the Data Highway
Maximum of one controller per Data Highway
Maximum of 8 controllers and Highways per system
Maximum of 15 sub-interface addresses per controller

*Cables required, to be specified on the SEP form.
Refer to Table 4-6 or Table 3-5 for cable lengths

7.1.17 X16-3021 HADIOS 16 Logic level Inputs

Installation Time: Minimum 1.5 hours

Packages: 1, LI400H printed circuit card

Installation Kit: 1, Customer Connector 41201802-002
Prerequisite: Hados Controller option 3011 or 3012
2 slots in the Data Highway plus 1 address line

7.1.18 X16-3022 HADIOS 16 Isolated (Relay) inputs

Installation Time: Minimum 1.5 hours
Packages: 1, II400H Printed circuit card
Installation Kit: 1, Customer Connector 41201802-002
Prerequisite: Hados Controller option 3011 or 3012
+24v Power Supply option 3094
2 slots in the Data Highway and 1 address line

7.1.19 X16-3023, 4, 5 HADIOS 16 Alarm Inputs

Installation Time: Minimum 1.5 hours
Packages: X16-3023: 1, AI401H Bi-directional Alarm Inputs
X16-3024: 1, AI402H Negative Alarm Inputs
X16-3025: 1, AI403H Positive Alarm Inputs
Installation Kit: 1, Customer Connector 41201802-002
Prerequisite: Hados Controller option 3011 or 3012
2 slots in the Data Highway and 1 address line

7.1.20 X16-3026, 7 One 8 Bit Counter Input Option

Installation Time: Minimum 2 hours
Packages: X16-3026: 1, CI401H High Speed Counter Input Card
X16-3027: 1, CI402H Low Speed Counter Input Card
Prerequisite: Hados Controller option 3011 or 3012 and 2 slots in the Data Highway
1 address line with standard option or
2 address lines with Preset and Interrupt facility

7.1.21 X16-3031 Hados 16 Logic level Outputs

Installation Time: Minimum 1.5 hours
Packages: 1, LO400H Printed circuit card
Installation Kit: 1, Customer Connector 41201802-002
Prerequisite: Hados Controller option 3011 or 3012
2 slots in the Data Highway and 1 address line

7.1.22 X16-3032 HADIOS 16 Pulse Outputs

Installation Time: Minimum 1.5 hours
Packages: 1, PO400H Printed Circuit Card
Installation Kit: 1, Customer Connector 41201802-002

Prerequisite: Hados Controller option 3011 or 3012
2 slots in the Data Highway and 1 address line

7.1.23 X16-3033 HADIOS 16 Isolated (Relay) Outputs

Installation Time: Minimum 1.5 hours
Packages: 1, IO400H Printed Circuit Card
Installation Kit: 1, Customer Connector 41201802-002
Prerequisite: Hados Controller option 3011 or 3012
2 slots in the Data Highway and 1 address line

7.1.24 X16-3043, 4, 7, 8, HADIOS Analogue Input Options

Installation Time: Minimum 3 hours
Packages: X16-3043: AD403H 10 Bit A/D Converter
X16-3044: AD404H 10 Bit A/D Converter
X16-3047: AD407H 10 Bit A/D Converter
X16-3048: AD408H 10 Bit A/D Converter
Installation Kit: 1, Miniature Plug Black 41201964-001
1, Miniature Plug Violet 41201964-008
1, Miniature Plug White 41201964-011
Prerequisite: Hados Controller option 3011 or 3012.
Each option requires 3 slots in the Data Highway
2 address lines required for I/O bus mode, or
4 address lines required for DMC mode.
Power Supply option X16-3093

7.1.25 X16-3049 HADIOS 16 Channel Multiplexer

Installation Time: Minimum 3 hours
Packages: 1, MX400H Multiplexer Card
Installation Kit: 1, Customer Connector 41201802-002
Prerequisite: Either option 3043, 3044, 3047 or 3048
2 slots in the Data Highway
Miscellaneous: Maximum of 4 Multiplexer Cards per analogue option

7.1.26 X16-3061, 2, 3, 4, HADIOS Analogue Output Options

Installation Time: Minimum 3 hours
Packages: X16-3061: 1, DA401H D/A Converter 0v to +5v
X16-3062: 1, DA402H D/A Converter 0v to +10v
X16-3063: 1, DA403H D/A Converter -5v to +5v
X16-3064: 1, DA404H D/A Converter -10v to +10v
Prerequisite: Hados Controller option 3011 or 3012
Power supply option X16-3093
Each option requires 2 slots in the Data Highway and 1 address line

7.1.27 X16-3093 HADIOS Power Supply (-15v and -24v)

Installation Time: Minimum 2.5 hours

Physical: Occupies the same space as a 1 x 3 option block

Cables: 1, cable 41263458-001 (2 ft.) Black 0 volt
1, cable 41263458-003 (2 ft.) Orange +15 volt
1, cable 41263458-004 (2 ft.) Blue -15 volt
1, cable 41263458-005 (2 ft.) Green -24 volt

Miscellaneous: One 3093 has sufficient capacity to drive a complete analogue sub system (options 304X and 306X)
Option 3093 must be mounted in the same drawer as the options it is supplying

7.1.28 X16-3094 HADIOS Power Supply (+24V)

Installation Time: Minimum 2.5 hours

Physical: Occupies the same space as a 1 x 3 option block

Cables: 1, cable 41263458-001 (2 ft.) Black 0 volt
1, cable 41263458-002 (2 ft.) Yellow +24 volt

Miscellaneous: One 3094 will drive up to 30 options 3022
Option 3094 should be mounted in the same drawer as the options it is supplying

7.1.29 X16-3330/40 12-Bit Analogue Input Option

Installation Time: Minimum 6 hours

Device: 12-Bit Pastoriza A/D converter and 3 power supplies

Packages: As contained in a 4 x 3 option block

Installation Kit: 2 kits 9153 and 4 kits 9154
3, Power supply mounting kits

Documentation: Option Manual 41286101040
A/D Converter Manual

Cables: *2, I/O cables 70013826-xxx (I/O connections for this unit are B21, B28 and C21, C28)
1, Analogue bus cable 41261258-001 B38 to A42 (18 inches)
1, A21 to ADC cable 41261439-001
1, Analogue input cable 41260226-001 (1 per 16 lines)

Miscellaneous: *Refer to Table 4-6 for 416/515 or Table 3-5 for 316 cable lengths
*Cables required to be specified on the SEP form

7.1.30 X16-4020 VLC Drive and Controller (26 ips)

Installation Time: Minimum 8 hours

Peripherals: One off X16-4022 (Master or Slave)

Packages: As contained in a 4 x 3 option block

Installation Kit: 4 kits 9153, 2 kits 9154, 1 kit 5981.
1, Junction Box 4250-001 (required if more than one drive).

Documentation: Option Manual 70130072278
Wire List 70025431
Plexedit DE-6 33201
Device Manual 42401009001
Device IPB 42401021001

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
*1, DMC cable 70013826-xxx for H316 or 516 with DMC (required if option is the only one on DMC in the option drawer)
2, Device cables 70021471-xxx (25 ft.)
1, Device cable 70013826-xxx (25 ft.)
1, Device cable 60107552-001 for each slave unit

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths.
*Required cables and lengths to be specified on the SEP

7.1.31 X16-4100 Tape Drive and Controller MTD 10C/11C

Installation Time: Minimum 8 hours

Peripherals: One Drive 4130 (36 ips) or one Drive 4140 (80 ips) (maximum of 4)

Packages: As contained in a 5 x 3 option block
Additional packages for DMC/DMA sub-channel (X16-4106/7):- 1 x CC-089, 1 x DL-335, 2 x DI-335
Additional packages for second drive unit:-
2 x DI-335, 2 x CM-022, 3 x CC-165
Additional packages for third drive unit:-
2 x CM-022, 3 x CC-165, 1 x CC-092
1 x PA-336, 2 x DI-335
Additional packages for fourth drive unit:-
2 x CM-022, 3 x CC-165, 2 x DI-335

Installation Kit: 5 kits 9153 and 3 kits 9154
An additional kit 9154 is supplied with the DMC/DMA channel.
GI Castor Stop 62364715 (4 per drive)
GI End Cover 62365135 (2 per drive)
Kit 9154 (2 per drive)

Documentation: Option Manual 70130071645
Wire List 70016771
Plexedit DE5A 02643
MTD 10C/11C Instructions 70130072087
MTD 10C/11C Drawings 70130072088

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
 *1, DMC/DMA cable 70013826-xxx (required if option is the only one on DMC/DMA in the option drawer)
 Device cable 70017182-xxx (25 ft.) 2 per drive
 Device power cable 70017200-xxx (9 ft.) 1 per drive

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
 *Required cables and lengths to be specified on the SEP form

7.1.32 X16-4110/4120 VLC Drive and Controller (16 ips)

Installation Time: Minimum 9 hours

Peripherals: One X16-4120 VLC Drive (max. of 4)

Packages: As contained in a 5 x 3 option block

Additional packages for DMC/DMA sub-channel (X16-4106/7 :-
 1 x CC-089 1 x DL-335 2 x DI-335

Additional packages for second tape drive:-
 2 x DI-335 2 x CM-022 3 x CC-165

Additional packages for third tape drive:-
 2 x DI-335 2 x CM-022 3 x CC-165

Additional packages for fourth tape drive:-
 1 x DI-335 2 x CM-022 3 x CC-165

Installation Kit: 5 kits 9153, 3 kits 9154 and 1 kit 9135
 An additional kit 9154 is supplied with the DMC/DMA channel and 2 extra 9154's with each additional drive

Documentation: Option Manual 42400343042
 Wire List 42503274/5/6
 Plexedit UP 33470
 Device Manual 42400343041

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
 *1, DMC/DMA cable 70013826-xxx (required if option is the only one on DMC/DMA in the option drawer)
 Device cable 70017182-xxx (25 ft.) 2 per drive
 Device Power cable 70017200-701 (9 ft.) per drive

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
 *Required cables and lengths to be specified on the SEP

7.1.33 X16-4150 9TK Tape Drive and Controller

Installation Time: Minimum 8 hours

Peripherals: One, 4153 Tape Unit (36 ips) or one, 4155 Tape Unit (80 ips)

Packages: As contained in a 6 x 3 option block
 Packages required for each additional drive:-
 3 x CC-165 1 x CM-022

Installation Kit: 6 kits 9153, 3 kits 9154, 1 kit 5967
 For Raised floor add:-
 1 kit 5975
 For each additional drive add:-
 1 kit 5971

Documentation: Option Manual 70130072424
 Wire List 70028510
 Plexedit DE-9 02643
 Device Manual 60037007

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xx
 *1, DMC/DMA cable 70013826-xxx (required if option is the only one on DMC/DMA in the option drawer)
 Device cable 70017182-701 (25 ft.) 2 per drive
 Power cable 42503021-001 (9 ft.) 1 per drive
 Ground cable 70015637-701 (25 ft.) 1 per drive

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
 *Required cables to be specified on the SEP form

7.1.34 X16-4400 Fixed Head Disc (DDC)

Installation Time: Minimum 9 hours

Packages: As contained in a 2 x 3 controller
 Additional packages for DMC sub-channel:-
 1 x DL-335 1 x DI-335

Peripheral: DDC Disc unit
 5 x 3 Disc electronics for max. of two disc units

Installation Kit: 2 kits 9153 and 2 kits 9154
 One Transformer 42504031
 An additional kit 9154 is supplied with a DMC sub-channel

Documentation: Option Manual 70130071650
 Wire List 70019050
 Wire List 70013278
 Vendor Manuals (DDC)

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
 *1, DMC cable 70013826-xxx (required if option is the only one on DMC in the option drawer)
 1, cable 70013826-722 (50 ft.) cable controller to disc electronics
 1, Power cable 42510313-001 (6 ft.)
 1, Control cable 70014120-701 (39 inches)
 2, DC power cables 70015100-701 (5.5 ft.)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
 *Required cables and lengths to be specified on the SEP

7.1.35 X16-4600 Moving Head Disc (10 Surface CDC)

Installation Time: 9.5 hours

Peripherals: One X16-4620 Disc Unit (100 track) or one 4621 Disc Unit (200 track) (max. of 4 disc units)

Packages: As contained in a 5 x 3 option block

Installation Kits: 5 kits 9153 and 2 kits 9154
1, Termination Unit 5998
1, Transformer 42500857 (one per three drives)

Documentation: Option Manual 130071862
Wire List 70019861
Vendor Manuals

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
*1, DMC/DMA cable 70013826-xxx (required if option is the only one on DMC/DMA in the option drawer)
1, cable 70016775-701 (25 ft.) controller to first disc drive
1, cable 70015637-xxx (25 ft.) ground bus to first disc drive
Cable 70016774-xxx (25 ft.) one per disc drive
Cable 42510082-xxx (25 ft.) one per disc drive
Cable 70016776-701 (10 ft.) one between disc drives
Ground Bus 70015637-703 (10 ft.) one between disc drives

Miscellaneous: H316-20/21 require the DMC/HSDMC enhancement
*Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Required cables and lengths to be entered on the SEP form
Ensure that a 3 phase supply is available for this option

7.1.36 X16-4650 Single/Dual Spindle Disc

Installation Time: Minimum 9.5 hours

Peripheral: One, X16-4652 Single or Dual Spindle Disc Unit (Max. of four spindles per controller)

Packages: As contained in a 6 x 3 option block

Installation Kits: Six kits 9153 and three kits 9154
1, Termination Unit 5998

Documentation: Option Manual 41286101057
Wire List 70026848
Plexedit BG 33410
155 Disc O&M Manual 42401013-001
155 Disc IPB Manual 42401019-001

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
*1, DMC cable 70013826-xxx (required if option is the only one on DMC in an option drawer)
1 cable, 70016775-xxx (25 ft.) controller to first drive
Cable 70016774-xxx (25 ft.) 1 per spindle
Cable 70016776-701 (10 ft.) 1 between disc units
Ground bus 70015637-xxx (25 ft.) 1 per disc unit

Miscellaneous: H316-20/21 requires the DMC/HSDMC enhancement
*Required cables and lengths to be specified on the SEP
*Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths

7.1.37 X16-4710 Moving Head Disc (10 Surface)

Installation Time: Minimum 9.5 hours

Peripheral: Ten Surface Discs 16-4730/1/2 (Max. of 4 drives per Controller)

Installation Kit: 6 kits 9153 and 3 kits 9154
1, Termination Unit 5998

Documentation: Option Manual 70130072318
Wire List 70030666
Plexedit BM 33416
Device IPB 60034958-100
Device O&M Manual 42401078

Packages: As contained in a 6 x 3 option block

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
*1, DMC cable 70013826-xxx (required if option is only one on DMC in the option drawer)
1 cable, 70016775-xxx (25 ft.) controller to first Drive
Cable 70016774-xxx (25 ft.) 1 per disc drive
Cable 70016776-xxx (10 ft.) 1 between disc drives
Ground Bus 70015637-xxx (25 ft.) 1 per disc drive

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Required cables and lengths to be specified on the SEP form
Ensure that a 3 phase supply is available for this option

7.1.38 X16-4720 Moving Head Disc (20 Surface)

Installation Time: Minimum 9.5 hours

Peripherals: One, X16-4721 20 Surface Disc Unit (maximum of 8 per controller)

Packages: As contained in a 6 x 3 option block

Installation Kit: 6 kits 9153 and 3 kits 9154
1, Termination Unit 5998

Documentation: Option Manual 41286101057
Wire List 70030666
Plexedit BM 33416
172/273/274 O&M Manual 42401078
172/273/274 IPB 60034958-100

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables
70013826-xxx
*1, DMC cable 70013826-xxx (required if option is
the only one on DMC in an option drawer) .
One cable, 70016775-xxx (25 ft.) controller to first
device
Cable 70016774-xxx (25 ft.) 1 per disc drive
Cable 70016776-xxx (10 ft.) 1 between disc drives
Ground Bus 70015637-xxx (25 ft.) 1 per disc drive

Miscellaneous: H316-20/21 requires the DMC/HSDMC enhancement

*Required cables to be specified on the SEP form
*Refer to Table 4-6 for 416/516 or Table 3-5 for
316 cable lengths
Ensure that a 3 phase supply is available for this
option

7.1.39 X16-4900 Fixed Head Disc (SAGEM)

Installation Time: Minimum 8.5 hours

Peripherals: One, X16-4932 Sagem Disc unit

Packages: As contained in a 3 x 3 option block

Installation Kit: 3 kits 9153, 1 kit 9154
1 kit 5995, 1 kit 5996

Documentation: Option Manual 41286101046
Wire List 41262077
Disc Manual 41286101048
Disc Maintenance 41286101049
Disc IPB 41286101050
Power Supply AMS-300 41286101078
Power Supply IPB 41286101052

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables
70013826-xx
*1, DMC cable 70013826-xxx (required if option is
the only one on DMC in the option drawer)
1, Device cable 41262098-001 (12 ft.)

Miscellaneous: H316-20/21 requires the DMC/HSDMC enhancement
*Refer to Table 4-6 for 416/516 or Table 3-5 for
316 cable length
*Required cables to be specified on the SEP form

7.1.40 X16-5054/56 Paper Tape Reader (1000 cps)

Installation Time: Minimum 4.5 hours

Peripherals: One, Facit Paper Tape Reader

Packages: As contained in a 1 x 3 option block

Installation Kit: 1 kit 9153, 1, kit 9154 and 1, Belzer screwdriver

Documentation: Option Manual 42400343024
Wire List 42502727/832/833
Facit Manual UB 700420
Tape Reader Tech. Description Facit 4001
Installation Book Facit 4001/4015

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables
70013826-xxx
1, Mains cable KS 995
1, Device cable 42510225-xxx (25 ft.)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for
316 cable lengths
*Required cables to be entered on the SEP form

7.1.41 X16-5081 Paper Tape Reader / Punch Controller

Installation Time: Minimum 2 hours

Packages: As contained in 1 x 3 option block

Installation Kit: One kit 9153

Documentation: PTR/P Controller Manual 42401026-001
Wire List 42505003/4/5

Cables: *2, I/O Jumpers 70014998-xxx or 2 cables
70013826-xxx

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for
316 cable lengths
*Required cables and lengths to be entered on the
SEP form

7.1.42 X16-5082/3 Paper Tape Reader (300 cps)

Installation Time: Minimum 3 hours

Peripherals: One, Paper Tape Reader (300 cps)

Packages: One, NC-028 located in X16-5081 Controller

Installation Kit: One kit 9154
8, Screws 0301002-058)
8, Washers 03020001-012) Option 5083 only
8, Nuts 03030004-002) (rack mounting)

Documentation: PTR Manual 42401028-001
PTR IPB 42401027-001

Cables: One, Device cable 42510392-xxx (25 ft.)
One, Power cable 42510406-701 (10 ft.)

Miscellaneous: None

7.1.43 X16-5084/5 Paper Punch (75 cps)

Installation Time: Minimum 3 hours

Peripherals: Facit 4070 Punch

Packages: 2 x DI-335 1 x NC-029
1 x NC-030 (located in X16-5081 Controller)

Installation Kit: One, kit 9154
8, Screws 03010002-058 } Option 5084 only
8, Washers 03020001-012 } (rack mounting)
8, Nuts 03030004-002 }

Documentation: Paper Tape Punch O&M Manual 42401052-001
Facit Manual + IPB UB 690707
Tape Punch Description Manual 4070
Tape Punch Instructions 4070

Cables: Device cable 42510393-001 (25 ft.) 5084 only
Device cable 42510393-002 (25 ft.) 5085 only
Mains cable 42400547-406

Miscellaneous: Additional installation material supplied by Facit

7.1.44 X16-5086/7 Paper Tape Punch (150 cps)

Installation Time: Minimum 3 hours

Peripherals: Facit 4060 (150 cps) Punch Unit
Honeywell Electronics Unit

Packages: 3 x DI-335 1 x BC-337 3 x CC-055
1 x FA-335 1 x PA-336 1 x NC-030
1 x NC-029
All contained in X16-5081 Controller 1 x 3

Installation Kit: One kit 9154
E13426 Tool Set
E14005 Spacing Template
E14009 Oil Can

Documentation: Paper Tape Punch O&M Manual 42401051-100
Facit Manual & IPB UB 691215
Facit Instructions 4060

Cables: Interface to Electronics Unit cable 42510240-xxx
(25 ft.)
Power cable to Electronics Unit 42510338-701
(10 ft.)
Facit cable E15517

Miscellaneous: None

7.1.45 X16-5120/21 Card Reader (400 cpm)

Installation Time: Minimum 6 hours

Peripherals: Card Reader H-123A (400 cpm)

Packages: As contained in a 2 x 3 option block

Installation Kits: 2 kits 9153, 1 kit 9154
for Standard floor add:-
1 kit 5959, 1 kit 5958
for Raised floor add:-
1 kit 5958

Documentation: Option Manual 70130072332
Wire List 70026010
Plexedit RS 02529
123A/223A O & M Manual 42401056-001
123A/223A IPB 42401012-001

Cables: *2 I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
*1 DMC cable 70013826-xxx (required if option is on
DMC and the only one in the option drawer)
1 Device cable 70021417-xxx (25 ft.)

Miscellaneous: Ensure a 3 phase supply is available for this option
*Refer to Table 4-6 for 416/516 or Table 3-5 for 316
cable lengths
*Required items to be specified on the SEP form

7.1.46 X16-5140 Card/Reader Punch

Installation Time: Minimum 6 hours

Peripheral: 5140 Card Reader/Punch (400 cpm) (similar to H214A)

Packages: As contained in a 3 x 3 option block

Installation Kit: 3 kits 9153, 2 kits 9154
for Standard floor add:-
1 kit 5959, 1 kit 5982
for Raised floor add:-
1 kit 5960

Documentation: Option Manual 70130072333
Wire List 70027710
Plexedit ED 02683
Device O & M Manual 42401057
Device IPB 42401224

Cables: *2 I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
*1 DMC cable 70013826-xxx (required if option is the
only one on DMC in an option drawer)
1 Device cable 70021471-xxx (25 ft.) Reader
1 Device cable 70022943-xxx (25 ft.) Punch

Miscellaneous: Ensure a 3 phase supply is available for the option
*Refer to Table 4-6 for 416/516 or Table 3-5 for
316 cable lengths.
*Required cables and lengths to be specified on the
SEP form

7.1.47 X16-5520/21 Line Printer (300 lpm)

Installation Time: Minimum 7 hours

Peripherals: 112 Line Printer (modified)

Packages: As contained in a 3 x 3 option block

Installation Kit: 3 kits 9153, 2 kits 9154 and 1 kit 5992

Documentation: Option Manual 70130072334
Wire List 70027575
Plexedit WV 33407
112 O&M Manual 42401032-001
112 IPB Manual 42401010-200

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xx
*1, DMC cable 70013826-xxx (required if option is the only one in an option drawer on DMC)
1, Device cable 70021471-xxx (25 ft.)
1, Device cable 70022943-xxx (25 ft.)
1, Ground bus 70015637-701 (25 ft.)
1, AC mains cable 42510097-xxx (25 ft.)

Miscellaneous: *Required cables to be specified on the SEP form
*Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths

7.1.48 X16-5522/23/24/25 Line Printer (650 or 950 lpm)

Installation Time: Minimum 7.5 hours

Peripheral: 222-3A or 222-4A Line Printer

Packages: As contained in a 3 x 3 option block

Installation Kit: 3 kits 9153, 2 kits 9154
for standard floor add:-
1 kit 5963, 1 kit 5985
for raised floor add:-
1 kit 5964

Documentation: Option Manual 70130072334
Wire List 70027575
Plexedit WW 02629
Device O & M Manual 42401031-001
Device IPB 42401035-001

Cables: *2 I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
*1 DMC cable 70013826-xxx (required if option is the only one on DMC in the option drawer)
1 Device cable 70021471-xxx (25 ft.)
1 Device cable 70022943-xxx (25 ft.)
1 Ground Bus 70015637-701 (25 ft.)
1 cable 42510097-xxx (25 ft.)

Miscellaneous: *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
*Required cables to be specified on the SEP form

7.1.49 X16-6222/6 Line Unit Interface

Installation Time: Minimum 3.5 hours

Packages: 16-6222, as contained in a 1 x 3 option block
16-6226, as contained in 2, 1 x 3 option blocks

Installation Kit: 1 kit 9153 and 2 kits 9154

Documentation: Option Manual 41286101067

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
2, cables 41260183-xxx length depending on configuration

Miscellaneous: Option 16-6226 consists of a basic 16-6222 1 x 3 block and additional auto answer control 1 x 3 block. The I/O bus is not routed through the additional 1 x 3

*Required cables and lengths to be specified on the SEP form

7.1.50 X16-6252 Asynchronous Multiplexed Line Buffer (MLB)

Installation Time: Minimum 3.5 hours

Packages: As contained in a 2 x 3 option block (including first pair of line controllers)

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: Option Manual 41286101-065

Cables: *2 I/O Jumpers 70014998-xxx or 2 cables 70013826-xxx
1 cable 41263206-001 (15 ft.) to Isolator (if Isolator ordered)
1 cable 41263303-001 (35 ft.) Modem to Isolator (if Isolator ordered)
1 cable 41263523-001 (50 ft.) MLB to Modem (if no Isolator ordered)

Miscellaneous: Line speed to be specified on the order documentation
I/O bus is only routed via B21, B28 and C21, C28 on this option

*Required cables and lengths to be specified on the SEP form

7.1.51 X16-6256 Synchronous Multiplexed Line Buffer (MLB)

Installation Time: Minimum 3.5 hours

Packages: As contained in a 2 x 3 option block (includes first pair of line controllers)

Installation Kit: 1 kit 9153 1 kit 9154

Documentation: Option Manual 41286101-066

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
 1, cable 41263206-001 (15 ft.) to Isolator (if Isolator ordered)
 1, cable 41263303-001 (35 ft.) Modem to Isolator (if Isolator ordered)
 1, cable 41263523-001 (50 ft.) MLB to Modem (if no Isolator ordered)

Miscellaneous: Line speed to be specified on the order documentation
 *Required cables and lengths to be specified on the SEP form

7.1.52 X16-6301/2/3/4 Line Units

Installation Time: Minimum 3.5 hours

Packages: X16-6301, As contained in a 1 x 3 option block.
 Max. 2 per 16-6222
 X16-6302, micropac for 16 lines inserted in 16-6301
 Max. 4 per 16-6301
 X16-6303, As contained in a 1 x 3 option block.
 Max. 7 per 16-6226
 X16-6304, micropac for max. 16 lines inserted in 16-6303

Installation Kit: X16-6301/3 : 1 kit 9153
 X16-6302/4 : 1 kit 9154 per 16 lines

Documentation: Option Manual 41286101067

Cables: 2, Jumper pacs 70014998-xxx for each 6301/3
 1, cable 41260183-xxx (6 ft.) for each 6302/4

7.1.53 X16-6401/3 Additional Pair of Line Controllers

Installation Time: Minimum 3.5 hours

Packages: As contained in a 1 x 3 option block

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: 16-6401 Option Manual 41286101065
 16-6403 Option Manual 41286101066

Cables: 1, Jumper pac 70014998-701 option 16-6401 only
 One cable 41263211-001 (15 ft.) Controller to Isolator (if Isolator used).
 One cable 41263303-001 (35 ft.) Isolator to Modem (if Isolator used)
 One cable 41263524-001 (50 ft.) Direct to Modem (if no Isolator used)

7.1.54 X16-6405 Self Clocking Option for 16-6403

Installation Time: Minimum 3 hours

Packages: As contained in a 1 x 3 option block

Installation Kit: One kit 9153

Documentation: Option Manual 41286101068

Cables: Cable 412860183-xxx (2 ft. max.)

7.1.55 X16-6431 Asynchronous Single Line Controller (ASLC)

Installation Time: Minimum 3.5 hours

Packages: As contained in a 2 x 3 option block

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: Option Manual 41286101069

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
 *1, DMC cable 70013826-xxx (required if option is the only one on DMC in the option drawer)
 One cable 41260183-001 (18 ft.) Controller to Isolator (if Isolator used)
 One cable 41263304-001 (35 ft.) Isolator to Modem (if Isolator used)
 One cable 41264039-001 (35 ft.) Controller to Modem (if no Isolator used)

Miscellaneous: ASLC on DMC with auto switch requires 3 DMC channels
 *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths
 *Required cables to be specified on the SEP form

7.1.56 X16-6433 Synchronous Single Line Controller (SSLC)

Installation Time: Minimum 3.5 hours

Packages: As contained in a 2 x 3 option block

Installation Kit: 1 kit 9153 and 1 kit 9154

Documentation: Option Manual 41286101070

Cables: *2, I/O Jumpers 70014998-xxx or 2, cables 70013826-xxx
 *1, DMC cable 70013826-xxx (required if option is the only one on DMC in the option drawer)
 One cable 41260183-001 (18 ft.) Controller to Isolator (if Isolator used)
 One cable 41263304-001 (35 ft.) Isolator to Modem (if Isolator used)
 One cable 41264039-001 (35 ft.) Controller to Modem (if no Isolator used)

Miscellaneous: SSLC on DMC with auto switch required 3 DMC channels
 *Required cables and lengths to be specified on the SEP form
 *Refer to Table 4-6 for 416/516 or Table 3-5 for 316 cable lengths

7.1.57 X16-6435 Self Clocking Option for 16-6433 (SSLC)

Installation Time: Minimum 3 hours

Packages: As contained in a 1 x 3 option block

Installation Kit: One kit 9154

Documentation: Option Manual 41286101071

Cables: One cable SSLC to SCO 41260183-xxx (max. 2 ft.)

Miscellaneous: SCO must be placed in the same drawer as the SSLC

*Required cable length to be specified on the SEP form

7.1.58 X16-6501/5/9 V24 Transducers

Installation Time: Minimum 3.5 hours

Packages: Option 6501, one 1 x 3 option block with capacity for up to 4, X16-6505 or 4, X16-6509
Option 6505, 4, CC252A micropacs for up to 8 dedicated lines
Option 6509, 4, CC252A micropacs for up to 4 auto answer lines

Installation Kit: 1 kit 9153
1 kit 9154 for each X16-6505/9

Documentation: Option Manual 41286101072

Cables: Modem cable 41263198-002 (35 ft.) 1 per option 6505 (if no Isolator)
Modem cable 41263199-002 (35 ft.) 1 per option 6509 (if no Isolator)
Isolator to Modem cable 41263198-001 (35 ft.) 1 per option 6505 (with Isolator)
Isolator to Modem cable 41263199-001 (35 ft.) 1 per option 6509 (with Isolator)

7.1.59 X16-6530 Isolators

Installation Time: Minimum 3.5. hours

Packages: Option 6533: One 1 x 3 option block for up to 4, 16-6535
Option 6535: Two IP-101H micropacs

Installation Kit: One kit for each X16-6533
One kit for each X16-6535

Documentation: Option Manual 41286101073

Cables: 1, earth braid 41263473-001 (30 ft.), option 6533
1, cable 41260183-010 (1 ft. 6 ins.) for V24 connection only, option 6535

7.1.60 X16-6540 Manual Controller Indicator Isolator Unit (MCII)

Installation Time: Minimum 3.5 hours

Packages: 16-6543 Rack or Table Mounting unit for up to 8, 6544/5 options
16-6544 Indicator Isolator Module for 1, ASLC option 6431
16-6545 Indicator Isolator Module for 1, SSLC option 6433

Documentation: Option Manual 41286101073

Cables: 1, Ground Bus (35 ft.) 41263473-002
1, DC power cable (20 ft.) 41263729-001